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Social Isolation and Health:
Structural Sources, Psychosocial Resources, and Social Contexts

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Social Isolation and Health:
Structural Sources, Psychosocial Resources, and Social Contexts

by

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Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

August 2015

Dedication

For my soul brother Dong-hee Keum

who left us prematurely in Summer 2003

but taught us to view world differently

Acknowledgements

This dissertation would not have been completed without people who have offered to me great deal of help and support during my graduate years in UT Austin. I would like to thank my committee members, friends, and family for standing by me in the process of completing my dissertation. My current and former advisors including Drs. Tetyana Pudrovska, Marc Musick, and Christopher Ellison deserve most scholarly accolades. They not only taught me how to conduct research but also demonstrated themselves what true scholars should be: Chris first offered me to engage in numerous research projects and trained me to write research papers; Marc ingrained me the importance of theory in sociology and convinced me of the salience of my dissertation; Tetyana taught me the strategies in publication and helped me wrap up the dissertation. My learning and understanding as a sociologist cannot be described without their influences.

My current and former committee members including Drs. Daniel Powers, Pamela Paxton, and Catherine Ross have also provided me with essential advices that improved the quality of the dissertation. I would like to thank Dan Powers for not only countless statistical consultations but also offering human support when I needed it the most. A thoughtful lending of his classic guitar helped me soothe my emotional outburst. I would also like to thank Catherine. She has shown consistent interest in my work and encouraged me to pursue my research. I also acknowledge Pam Paxton for constructive comments on my work. Needless to say, my accomplishment has been heavily indebted to their warm interest and concern.

Many thanks also go to a number of great friends I made in Austin: Cate McNamee, Angela Howard, Hortencia Jimenez, Margaret Vaaler, Hyeyoung Woo, Chang-hwan Kim, Christian Paredes, Evelyn Porter, Mark Boze, Tony Plepys, Zosia & Joseph Hunt, and many others. As fellow graduate students, colleagues, a graduate advisor, and neighbors and friends, they all commonly contribute to the achievement in many different ways. In addition, special thanks to three ladies --Patricia, Rainbow, and Tricia-- who graciously offered timely help in taking care of Jeewon during the three-week visit to Austin in Summer 2015. I am lucky to get to know each of these great people.

Last but not least important, my dissertation is a decadal product of family support. My wife, Yujin kim is a heroin to me. On top of mothering three growing children (Jeewon, Jeemin, and Jeeyu), she marshalled herself a full time graduate student life with me. I am proud that we have made this far since we launched the journey in 2005. In addition, I would like to show my deepest respect to my parents. My father, Youn-eik Lee, and mother, Jae-hwa Ku, have made who I am today. Their love, encouragement, and trust have nourished me to earn this degree. My father in law, Young-hwan Kim, and mother in law, Gi-oh Jeong, also trusted my decision and showed biggest support that propelled me to reach the goal. I will never forget my mother in law who visited Austin twice to take care of Yujin when she delivered Jeewon and Jeemin. Lastly, I would like to express my sincere gratitude to my sister Myoung-jin Lee, brother in laws Dae-wook Kim and Yangsoo Kim, and other family members for their continued love and support.

Social Isolation and Health:
Structural Sources, Psychosocial Resources, and Social Contexts

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The University of Texas at Austin, 2015

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Humans are social beings so much that the feelings of not being connected to others may increase physical and mental problems. Despite ample research documenting the health risks of social isolation, we still do not understand the mechanisms through which social isolation affects health. Existing research lacks an overarching framework that would explore a broader context of social isolation and health including socioeconomic, relational, and psychosocial characteristics. This is a goal of the present dissertation.

This study builds on the large body of research that has investigated the relationship between social isolation and health by considering two aspects of social isolation defined as *no confidant* and *loneliness*. In order to address the problem identified above, this study proposes a conceptual framework designed to study social isolation in relation to other important factors that are presumed to interact with social isolation. The proposed framework includes the following propositions: (a) a lower level of socioeconomic status leads to social isolation; (b) a lower level of social ties leads to social isolation (c) social isolation is associated with a lower level of

psychosocial resources (i.e., perceived support, personal mastery, and self-esteem), net of SES and social ties; (d) adverse effects of social isolation on health is partly mediated by psychosocial resources; (e) negative impact of chronic stressor (i.e., economic hardship) is greater among those who are socially isolated; (f) positive impact of psychosocial resources on health is weaker among those who are socially isolated.

Analyses of a nationally representative longitudinal sample from the U.S. generally support these arguments. This study found that social isolation is a product of both socioeconomic status and social integration: Higher education, being employed, and having more income all contributes to the lower likelihood of social isolation; community ties, social network ties, and intimate ties are associated with lower chance of reporting social isolation. This study also found that social isolation predicts lower level of each of perceived support, personal mastery, and self-esteem, net of SES and social ties, and these associations in turn mediate adverse effects of social isolation on health. Furthermore, this study found that social isolation moderates the association between chronic stressor and health. Findings showed that social isolation amplifies adverse health effects of economic hardship and attenuates protective effects of psychosocial resources.

The implication of main findings, the study limitations, and the recommendation for future research are also discussed.

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CHAPTER 1: INTRODUCTION

1.1. STATEMENT OF PROBLEM AND PURPOSE OF STUDY

Previous research on social relationships and health has identified deleterious health consequences caused by the lack of social relationships. Scholars have reported that a lack of social integration (e.g., having a small social network or infrequently participating in institutional activities) and low levels of support (e.g., perceived emotional support) have been associated with poorer physical and mental health and a shortened life span, as well as a number of additional undesirable health outcomes (Berkman & Glass, 2000; Cacioppo & Hawkley, 2003; Ellison, 1991; Holt-Lunstad, Smith, & Layton, 2010; J. S. House, Landis, & Umberson, 1988; Mirowsky & Ross, 2003b; Musick, House, & Williams, 2004; Pearlin, 1989; Thoits, 2011). Although the health risks associated with social isolation have been compared to the damaging effects of cigarette smoking, elevated blood pressure, and obesity (House et al. 1988), our knowledge of social isolation has fallen short of revealing a comprehensive structure of social isolation. Existing research on social isolation and health has been characterized by several important limitations that must be addressed in order to advance our understanding in the study of social isolation and health.

One urgent problem associated with previous approaches to the study of social isolation and health includes the fuzzy conceptualization of social isolation. To date, social isolation has been loosely defined and is rarely used as a stand-alone concept (Cornwell & Waite, 2009a; J. House & Kahn, 1985; J.S. House, 2001). The term has served as a functional antonym to fulfilled social relationships and therefore has suffered from not possessing its

own independent properties. Although there have been exceptions where both objective and subjective aspects of social isolation have been estimated simultaneously (see Cornwell and Waite 2009 and Lin et al 1999, for example), separating social isolation from general social relationships has rarely been attempted. While this dominant past approach has produced valuable learning regarding the general association of social isolation with worse health outcomes, failing to distinguish the key characteristics of social isolation from the general indicators of social relationships may have contributed to the slow progress towards an understanding of why and how social isolation is linked to worse health (J.S. House, 2001; Thoits, 2011).

A second problem is that previous studies have paid little attention to structural and relational influences on social isolation (J. S. House, Landis, et al., 1988; N. Lin, Ye, & Ensel, 1999; Mirowsky & Ross, 2003b; Paxton, 1999; Umberson & Montez, 2010). Almost thirty years ago House and colleagues (1988: 308) argued that "no attention has been paid to social integration, networks, or supports as dependent variables." This statement still remains relevant despite the proliferation of research on social relationships and health in recent years. Moreover, House et al. (1988) also emphasized that "the determinants of these [social relationships], as well as their consequences, are crucial to understanding the theoretical and causal status of social relationships in relation to health" (308). Given that the deleterious effect of social isolation on health is arguably one of the most consistent findings produced by studies on social relationships and health, understanding the structural antecedents of social isolation is likely to provide knowledge that would uncover the social roots of this seemingly individual problem.

A third problem is that past studies investigating the link between a lack of social relationships and health generally fail to simultaneously consider multiple mechanisms influencing the effects of social isolation on health (Aneshensel, Rutter, & Lachenbruch, 1991; Cornwell & Waite, 2009b; J. S. House, Umberson, & Landis, 1988; N. Lin et al., 1999; Thoits, 2011; Turner & Marino, 1994). Previous studies have been successful in showing how individual mechanisms (e.g., perceived social support, sense of control, and self-esteem) operate, but they rarely evaluated different mechanisms relative to each other. As a result, "we still do not understand the dynamic process through which social relationships" affect health (Thoits, 2011). Understanding each mechanism as it relates to other mechanisms will allow researchers to answer a number of important questions. For example, which psychosocial resources (e.g., social support, sense of control, and self-esteem) explain the link between social isolation and health more fully than others? Or, which psychosocial resources interact more closely with different aspects of social isolation? These questions have not been answered clearly so far and are in need of more academic inquiry.

Finally, previous studies of social isolation have not paid extensive attention to the role of social isolation in the stress process particularly in the interplay between chronic stressors and coping resources (Krause, 1991; Pearlin, Menaghan, Lieberman, & Mullan, 1981; T. Pudrovska, Schieman, Pearlin, & Nguyen, 2005). Not only is social isolation in itself an important influence on health, but it can also act as a "demand" by exacerbating the burden of concurrent stressors and undermining the stress-buffering power of individual psychosocial resources (Kaplan, 1996). Although examining the role of social isolation as a "stress amplifier" is important as it may shed new light on how the effects of stressors may be amplified as opposed to buffered, this possibility has not been fully scrutinized by previous

scholarly efforts. We do not know whether social isolation exaggerates the perception of stressful situations and/or compromises coping resources used in dealing with those situations, to thus result in even poorer health consequences (Krause, 1991).

The present dissertation is intended to address these limitations and advance current knowledge in several important ways. It will include discussion on the following topics:

- A clear definition of social isolation as a unique construct distinct from other measures of social relationships including the theoretical development and empirical evaluation of a multidimensional concept of social isolation
- Structural origins of social isolation
    - How structural social factors (i.e., socioeconomic status and social ties) are associated with social isolation (i.e., no confidant and loneliness).
- Health consequences of social isolation net of its socioeconomic and relational antecedents
    - How social isolation affects self-rated health and depressive symptoms
- Mechanisms explaining the effects of social isolation on health outcomes
    - How social isolation affects personal mastery, self-esteem, and support
    - How personal mastery, self-esteem, and support mediate the effects of social isolation on health, and the relative importance of each of these mediating mechanisms (understanding how each mechanism matters in relation to the others)
- The “stress-amplifying” effects of social isolation
    - Social isolation as magnifier of the direct deleterious effects of chronic stressors on health

- Social isolation as a factor that undermines the protective capacity of positive self-perceptions, thus further increasing individual vulnerability to chronic stressors

Addressing the issues listed above will help to advance the understanding of social isolation and health in several ways. First and foremost, the results of this study will improve our understanding about the role of social isolation in relation to other key elements identified by previous research. This is a very important step because the results will then allow researchers to develop a problem-solving approach with which to address the impact of social isolation. Formulating key structural and psychosocial factors in relation to social isolation will help researchers better understand why and how social isolation impacts health. In turn, updated knowledge will help researchers address the problems associated with social isolation more effectively. Secondly, understanding objective social conditions and subjective self-perception together in relation to social isolation will lead to significant improvement in the study of social isolation because it will allow researchers to take advantage of the strength of interdisciplinary research accumulated in past years (Cornwell & Waite, 2009b; Schnittker, 2007). As repeatedly pointed out by many scholars, human behaviors are complex. Taking into account both structure and agency in relation to human behavior is critical in order to understand the linkage between social isolation and health (Cornwell & Waite, 2009b; Mirowsky & Ross, 2003b; Schnittker, 2007). Thirdly, the results of this study will provide updated knowledge in this line of research because past studies have not paid as much attention to the changing nature of social relations. Human behaviors change over the years and it is important to account for this in the study design. This study follows respondents over sixteen years with data gathered at four occasions during the span of time.

Providing longitudinal evidence will be a significant plus to the current research on social isolation and health.

1.2. TERMINOLOGY

Although most terminology is defined in subsequent chapters in more detail, it is helpful to clarify here the specific usage of various social relationship terms in order to avoid potential confusion. First, social isolation comprises two components: no confidants and loneliness. The term "social isolation" is used interchangeably with "perceived social isolation." The terms "no confidant" and "loneliness" are used when more specific explanations are needed. Second, the term "social ties" is akin to social integration and refers to objective social relationships divided into three levels (i.e., community ties, social network ties, intimate ties). The term "social participation" is often included in social integration/social ties but emphasizes voluntary/active involvement as opposed to the mere presence of social relationships. The term "perceived social support" indicates an individual's subjective evaluation of social relationships and is used interchangeably with "perceived support" or just "support" in this study. Conventionally, social integration refers to the *structure* of social relationships, whereas social support points to the *content* of social relationships. Third, the term "strong ties," which may be replaced with significant others/confidants, is contrasted with "weak ties" to emphasize the heterogeneous nature of human networks (Granovetter, 1973; J. House & Kahn, 1985; Smith & Christakis, 2008).

1.3. Organization of the Dissertation

This dissertation is guided by an overarching conceptual framework as shown in Figure 1. The following propositions derived from the conceptual framework will be tested empirically using the nationally representative four-wave panel data, American Changing Lives (ACL) (James S House, 2007):

(1) a lower level of socioeconomic status leads to social isolation;

(2) a lower level of social ties leads to social isolation, net of socioeconomic status;

(3) social isolation is associated with lower levels of self-perception (i.e., support, personal mastery, and self-esteem), net of SES and social ties;

(4) the adverse effects of social isolation on health are partly explained by psychosocial resources;

(5) the negative impact of chronic stressors (i.e., economic hardship) is greater among those who are socially isolated;

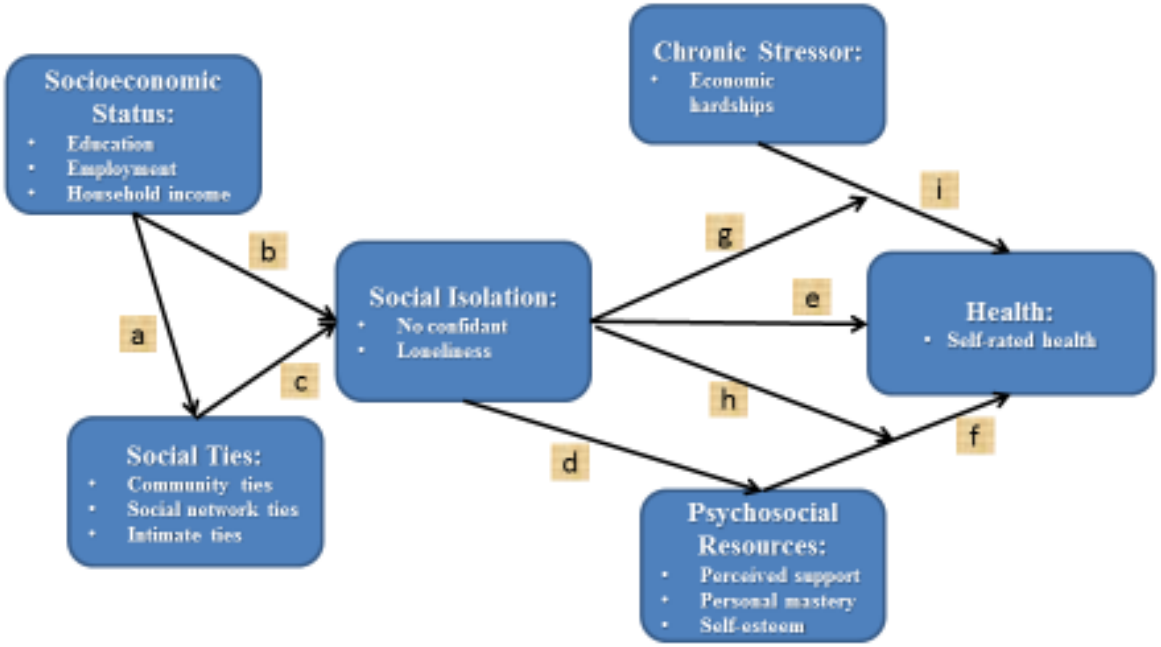
(6) the positive impact of psychosocial resources on health is smaller among those who are socially isolated.

These six propositions are the basis of the three empirical chapters comprising this dissertation. *The first* empirical chapter focuses on propositions (1) and (2) and examines the association between structural social factors (i.e., socioeconomic status and social ties) and social isolation (i.e., no confidant and loneliness). *The second* empirical chapter addresses propositions (3) and (4) by analyzing the associations between social isolation and psychosocial resources (i.e., support, personal mastery, and self-esteem) and the mediating role of each psychosocial resource in the association between social isolation and health

outcomes (i.e., self-rated health and depressive symptoms), net of SES and social ties. *The third* empirical chapter addresses propositions (5) and (6) by investigating the "stress-amplifying" hypothesis that posits that the impact of chronic stressors is exaggerated and the capacity of coping resources is compromised among those who are socially isolated.

In addition to the empirical chapters listed above, chapter 2 provides the theoretical background and the review of the literature on the connection between social conditions, social isolation, psychosocial resources, and health. Chapter 3 describes the data, measurements, and methods. The results of three empirical studies which address the six propositions of this research are presented in Chapters 4, 5, and 6, respectively. Finally, a summary and a discussion of the results, limitations of the study, and potential directions for future research are provided in Chapter 7.

Figure 1.1: Conceptual Framework



CHAPTER 2: THEORETICAL BACKGROUND AND LITERATURE REVIEW

2.1. INTRODUCTION

This dissertation focuses on two types of social isolation: (a) no confidant and (b) chronic loneliness. Below I review and synthesize theories and empirical research documenting how these two types of social isolation are related to structural variables (i.e., SES, and social ties (paths a, b, & c in Figure 1)) and to core psychosocial resources and health (i.e., social support, personal mastery, and self-esteem (path d, e, & f in Figure 1)). Moreover, I propose a 'stress amplifying hypothesis' which is designed to enhance the stress process paradigm by supplementing it with a possibility in which the effects of stressor are amplified (path g in Figure 1) and the effects of psychosocial resources are attenuated (path h in Figure 1).

2.2. CONCEPTS OF SOCIAL ISOLATION

2.2.1. Social Isolation as Social Pain

Despite the controversy over the exact figures, there is no doubt that a dramatic increase in social isolation between 1985 and 2004 has garnered significant attention not only among the scholarly community but also among the general public. The number of social isolates in the study– measured as those who have no significant others- increased from 10 to

25 percent over the study period (C.S. Fischer, 2009; McPherson, Smith-Lovin, & Brashears, 2006).

Why do we pay so much attention to the changing nature of social relationships, or the ways in which we are connected? There are several possible answers. One may perceive that the changes in social relationships, or at least some signs of them, such as a decline in civic engagement, or decrease in the frequency of family dinners, reflects the decay of social cohesiveness or at least indicates the decline of traditional forms of human interactions (Putnam, 2001). Others may argue that our social connectedness is intact, yet the mode of connection may have changed due to a collective effort to adapt to a new environment (C.S. Fischer, 2005; C S Fischer, 2011). The kinds of debates or concerns regarding the changing nature of social relationships are nothing new (Bellah, 1996; C S Fischer, 2011), yet, in my view, it reflects who we are as the human species: we cannot ignore the value and meaning of social connections.

Evidence beyond social science starts to show that fulfilling social relationships, or the lack thereof, have significant consequences on our body observable at physiological levels. Recent studies from neuroscience, physiology, and evolutionary human biology on human connections have started showing that our body (i.e., brain) responds similarly to social exclusion or social rejection as it does physical pain (Eisenberger, 2012a, 2012b). Relatedly, recent studies on cortisol and strain in social relationship show that persons who feel that their social networks are demanding, critical, or unreliable report poor profile of cortisol regulation (Friedman, Karlamangla, Almeida, & Seeman, 2012; Tetyana Pudrovska, 2013). When we feel alone, are unable to fit in, or sense significant risk in intimate connections, then that stimulates the same region of brain as responsible for physical pain

(Eisenberger, 2012b). This line of research shows that our cells have evolved such that our sensitivity to social connections and interactions are deeply embedded in our DNA as a part of survival tool kit (Cacioppo & Hawkley, 2009).

2.2.2. No Confidant and Loneliness

Social isolation is a concept that stands at the opposite pole to fulfilling social relationships. Importantly, social isolation is multidimensional just as social relationships are. According to Mirowsky and Ross (2013:213), social isolation is marked by "sense of not having anyone who is someone to you and not being someone to anyone." As this statement indicates, the feature of social isolation refers to two properties: (a) a person and (b) feelings attached to that person. It is crucial to recognize the importance of taking into account both aspects when we attempt to understand the concept of social isolation. Without considering both aspects simultaneously, we may fall short in understanding the full picture of social isolation. In this section, the primary goal is to identify the central components of social isolation that are expected to have a link to structural conditions as well as to self-perceptions. The features of two social isolation measures, no confidant and loneliness, are discussed alongside their standing within the research traditions of sociology and psychology.

Confidants refer to persons with whom one would share important information or private matters (Thoits, 2011). These types of people comprise the inner circle of personal networks and tend to have long relationships with each other and share significant portions of their life courses together (Antonucci & Akiyama, 1995; Storr, 2005). They are important people and typically include spouses, family members, and close friends. Understandably, networks of confidants are characterized by being small in size, informal, intimate, and

enduring. The term *strong ties* fits well with these types of personal networks (Granovetter, 1973).

Given the characteristics of confidants, what might be the features of no confidant? First, reporting no confidant may suggest the non-existence of an inner circle of an individual's personal network. Second, the status of no confidant may imply different evaluation criteria used when assessing a role-based measure such as the presence of a spouse or partner. That is, it is likely that those intimate relationships imply the presence of confidants but this is not necessarily the case. Confidant status is not guaranteed by the social roles (e.g., spouse) filled by individuals, but rather depends on the involved parties' evaluation of the function of the relationship. Recognizing the difference between the two criteria is important because when it comes to social isolation and its potential negative effects, I argue, that the degree of distance between the objective role and the subjective evaluation of the objective condition may point to the salient feature of social isolation.

It is, however, important to recognize the distinction between non-existent and deficient[1]. No confidant, when reported may simply indicate that there is no such person. It is tempting to assume that having at least one confiding figure is a necessary condition for human relationships. Attachment theory highly emphasizes this view (Bowlby, 2008). It is, however, also important to recognize that there is a great deal of variations in the need of belongingness or for attachment figures. Some people need more attention in relationships than others (Cacioppo & Hawkley, 2009), And theoretically, it is possible to not have a such

[1] No confidant indicates no confiding relationships yet it may not mean feeling lonely if one does not need one or more confidants. Although attachment theory strongly implies the need for key attachment figures, if one seeks meaning in life primarily from channeling inner energy into creative activities instead of pursuing or relying on personal intimate ties, that person then may not feel lonely nor alienated. Instead, that individual's state may be described better with the term *solitude* than *loneliness,* and it may lead to genuine self-expression of the joy of connection between the self and the world one is in (Storr, 2005).

confiding figure and still feel normal. When all this information is evaluated together, I argue that the measure of no confidant demonstrates some interesting aspects that reveal the core characteristic of social isolation.

Feeling loneliness encompasses reactions to non-fulfillment of intimate and social needs (Cacioppo & Hawkley, 2009). It is also described as "a universal human experience that results from a perceived or actual deficiency in one's social relationships" (MacEvoy & Asher, 2012)(178). Although loneliness is multifaceted, as discussed below, I argue that the defining characteristic of this measure involves perceived 'deficiency' or 'inadequacy' in personal relationships. It is, again, important to recognize the different degrees of the sense of connectedness desired by individuals (Cacioppo & Hawkley, 2009). In this regard, not reporting any confidant may not imply a deficiency because this is acceptable for some individuals. On the other hand, however many people a person might have relationships with, that person is still subject to feeling lonely if the need to truly belong is not met.

2.2.3 Previous Approach to the Study of Social Isolation

In addressing the problem from an interdisciplinary view point, scholars from sociology and psychology have examined multiple forms of social isolation in relation to health. Three forms stand out: (a) low quantity of social integration based measures (b) low quality of support, especially perceived emotional support, and (c) a sense of loneliness (Cornwell and Waite 2009). Traditionally, sociologists have focused on studying the first and second forms while psychologists have studied the third, and to a lesser degree, the second. Despite this division of research interests, what is clear to me is that all three forms of social isolation reflect different aspects of social isolation and thus need to be considered together in

a general examination of social isolation. Relevant to that end, Cornwell and Waite (2009) point out that most of the work on social isolation and health has examined only one or two aspects of social isolation.

Among many perspectives on loneliness within psychology, there is a social needs perspective proposed by Weiss (1973) that recognizes and emphasizes that different social relationship factors and social needs may lead to loneliness. According to Weiss, there are two types of loneliness: (a) 'loneliness of emotional isolation' and (b) 'loneliness of social isolation'. The former is expected to occur when social needs for intimacy and attachment are not met due to the lack of a relationship with an attachment figure such as a parent or partner. The latter is expected to occur when the need for social integration is not met because a person does not have access to a group of members providing a sense of group affiliation or belongingness (Weiss, 1973). These two forms are then only to be alleviated through the formation of the specific type of relationship that is lacking. Similar distinctions were made in later years by other psychologists: (a) social loneliness versus emotional loneliness (Van Baarsen, Snijders, Smit, & Van Duijn, 2001), (b) isolation versus loneliness (de Jong Gierveld & Hagestad, 2006), and (c) social disconnectedness versus perceived isolation (Cornwell and Waite 2009).

Despite the slightly different uses of terminology, both psychology and sociology have used and developed in common two distinct but related aspects of social isolation. The first is emotional loneliness resulting from a lack of intimate attachment and the second is social loneliness resulting from the lack of membership in a desired group. Although psychologists emphasize subjective perception instead of objective conditions, both essential

elements they use are remarkably similar to how sociologists differentiate perceived support from social integration.

These two aspects of social isolation are not unrelated, but the level of relatedness is modest. According to the 20-item Loneliness Scale, for example, emotional loneliness was related to three items assessing feelings regarding relationships with individuals. Social loneliness, on the other hand, was correlated with three items assessing feelings regarding relationships with groups of individuals. There was only a small correlation coefficient (.17, with statistical significance) between the two sets of items, but there existed strong correlations between both types of loneliness and the total scale score on the UCLA scale and significant correlations between both types of loneliness with most of the individual items on the UCLA scale. Additionally, both social loneliness and emotional loneliness were associated with depression (Russell, Cutrona, Rose, & Yurko, 1984).

In sum, social isolation may be an important concept that deserves comprehensive understanding regarding its structural sources, psychosocial processes, and health consequences. In searching for the sources of social pain, this study focuses on two structural factors (i.e., SES and social ties) that may be responsible for it. Social isolation is typically regarded as a relational deficit. Lack of social ties, or any lack of observable human interaction, is likely to be attributable to social isolation, in the first place. However, it is also likely that poor social connections themselves may have underlying causes. This study considers SES, or hierarchical social standing, as the 'cause of cause' of social isolation. In the following section, structural social factors, SES and social ties, are linked to social isolation

2.3 Structural Sources of Social Isolation

2.3.1. Socioeconomic Status and Social Isolation

Fundamental-cause theory considers social conditions as "fundamental causes" of health inequalities (Bruce Link, 2008; BG Link & Phelan, 1995). The theory emerged in response to the Risk-Factor Model that had dominated medicine and epidemiology. The risk-factor approach is a useful approach when dealing with specific types of disease, but the uses of focusing on proximate risk factors as a means for reducing SES disparity are limited. This is mainly because focusing only on proximal risk factors typically fails to address the role of fundamental cause of social conditions that produce "causes of causes" or "risk of risk" of social problems. For this, focusing only on the specific underlying mechanisms between SES and Health gradient may not produce fundamental treatments/solutions for eliminating the differences in health.

Although the theory of fundamental-cause generally aims to explain persistent/widening health inequalities between different social classes, the main principles of this theory may provide important implications for the study of social isolation (BG Link & Phelan, 1995). First, social isolation may be a social product reflecting social conditions (paths b & c in Figure 1). Differences in social standing or the ways in which society is organized may impact our feelings of social connection. To the extent that social stratification matters to interpersonal connectedness, different social standings may also have implications for social isolation (paths a, b & c in Figure 1). Moreover, social isolation may serve as one of the 'social' risk factors that operate between social conditions and multiple disease outcomes (path e in Figure 1). As discussed earlier, the feeling of social isolation triggers

social pain, which also may activate stress response mechanisms if it persists (Cacioppo et al., 2002) When all these factors are considered, fundamental-cause theory offers theoretical plausibility that social isolation may act as a product of social conditions. Building on this theoretical formulation, each component of socioeconomic status is linked to social isolation below.

Why might higher levels of education lead to a lower chance of social isolation? There is a lack of direct evidence pointing to how each component of SES may contribute to preventing social isolation as defined in this study. However, each component of SES has been studied extensively and its linkage to other important life outcomes has been documented (Elo, 2009; Herd, Goesling, & House, 2007; Marmot, 2005; Wilkinson, 1997). Therefore, I provide some indirect evidence instead.

First, education is the leading component of SES that helps to build other components of SES, which may have sequential implications for how SES might relate to reducing the likelihood of social isolation, which is discussed below more detail below. Second, the principle role of education is to build "human capital" via learned effectiveness, which stays with individual throughout their life. With a similar note, research documents that education promotes high sense of controls via problem solving experiences (Mirowsky & Ross, 2003a, 2003b). The enhanced human capital among high SES individuals in turn are likely to contribute to develop relational capacities that help build more social ties, manage existing ties more effectively, or even transform any available relational ties into more or less cohesive ones, thereby decreasing the chance of feelings of social isolation. More research showing the effectiveness of education on social isolation is needed.

Second, employment provides a means through which individuals engage in activities directed toward production or accomplishment. The better-educated do work that is more creative and autonomous, that does not require close supervision, that provides opportunities for workers to make their own decisions. The consequences of these job characteristics are known to improve emotional well-being. Work that is creative, non-routine, and gives persons a chance for continued learning and development also decreases distress. (Elo, 2009; Kunz-Ebrecht, Kirschbaum, & Steptoe, 2004; Bruce Link, 2008; J. Mirowsky & C. Ross, 2007; Williams & Collins, 1995). The desirable characteristics of high SES jobs and beneficial consequences associated with good employment suggest that feelings of social isolation is less likely to be present with 'good' jobs. This is so because those good jobs are likely to reflect the quality of human capital that may be attributable to higher educational achievement. Additionally, it is also likely that a good job itself provides relational opportunities in which high SES individuals to form and develop strong ties among like-minded individuals (e.g., homophiles principle).

Third, high income protects individuals from chronic financial stress and facilitates access to health-generating resources (e.g., superior housing in safe neighborhoods, leisure activities, healthy diet, utilization of medical care, etc.) (Elo, 2009; Mirowsky & Ross, 2003a, 2003b).

2.3.2. Social Ties and Social Isolation

Social relationships are composed of two distinct but related aspects: (a) social integration or structural component and (b) social support or the content of the structure of social relationships (J. House & Kahn, 1985; N. Lin et al., 1999; Mirowsky & Ross, 2003b).

Those who are closely integrated into society are more likely to receive quality social support and those who perceive a good amount of readily available support are probably deeply embedded in society. While these two aspects most likely go hand-in-hand, they are not guaranteed --as in the case of marriage. On average those who are married are better off, but those who are suffering marital discord are far worse off than their unmarried counterparts (Mirowsky & Ross, 2003b; Umberson, Williams, Powers, Liu, & Needham, 2006). Although not all research on social relationships differentiates these concepts, it is important to do so both for theoretical and analytical purposes (N. Lin et al., 1999).

No confidant means that there is no one with whom one can share his or her private feelings and concerns. But how does having no confidant relate to other types of social interaction? On one hand, it may mean that one has no social relations. However, a person with no confidants could still have a spouse, children, some interpersonal networks, and some level of community participation. Even though ego is connected with society through various types of social relationships, ego does not equate to having a person with whom one can share personal feelings.

Furthermore, beyond the differential effects of different social ties on health, it is also plausible that the quality of social ties matters for social isolation. Even though the measure used in this study is having no confidant, respondents are not necessarily disconnected from society in the following forms: (1) community ties; for example, frequency of church attendance or frequency of volunteer activity, (2) social network ties; for instance, hanging out or having phone conversations with friends or relatives, or (3) intimate ties; for example, having a spouse or partner. The social isolates in the study may still be connected to society via community involvement, interpersonal networks, and/or living with a spouse or partner.

What they particularly lack is someone with whom they can share private feelings or concerns.

As discussed earlier, this state of no confidant possesses a unique combination in terms of social integration and social support. First, social integration is predictive of social isolation. Put in a different way, social integration is based on subjective assessment of personal networks that probably reflects structural as well as functional (or emotional) aspects of social relationships. Because this is based on subjective evaluation it is possible to have some degree of discrepancy between it and objective social connections. Individuals can feel alone or lonely despite abundant objective social ties. Ordinary adult people live with a spouse or partner, are most likely to have or had children, engage in some interpersonal networks, and participate in social activity one way or another. The levels of connection vary significantly, however, absolutely no interaction is very unlikely. Therefore, empirical questions must be asked regarding the association between objective social ties and subjective evaluation of ties. Similarly, the association between subjective evaluation of quality of support (i.e., social support) and subject evaluation on personal networks is a matter which also calls for empirical scrutiny. It is likely that the feeling of no confidant is a product of negative support or a lack of positive support, but the specific association remains untested.

Using a lack of strong ties as a measure of social isolation might be useful for several reasons. First and foremost, strong ties play significant roles throughout life whether in daily events or highly stressful ones. As illustrated above, the critical function these people perform is well documented. The mounting evidence regarding the pivotal function of strong ties suggests that not having any of them is a type of serious social isolation. Second, strong

ties reflect both a structural aspect and a qualitative evaluation of social relationships. Strong ties are often employed as a social integration measure based on their quantifiable features that represent the extent of social embeddedness (i.e., existence or quantity of social relationships). However, unlike other strict measures of social integration such as having a partner, strong ties or the lack thereof reflect the qualitative assessment of existing ties, which is one of the defining characteristics of social support, particularly when it comes to perceived emotional support. Next, the main unit of analysis in strong ties is the number of individuals. While other measures of social relationships impose an arbitrary "appropriate threshold" of social isolation (i.e., relative quantity of social integration and relative quality of social support), social isolation in strong ties is relatively straightforward since no confidant is the lowest quantity. Given the plausible theoretical link between the report of confidant and various types and levels of social relationships, it will require empirical scrutiny to determine whether/how much the different levels of social ties and social isolation correspond to each other.

2.3.3. Socioeconomic Status and Social Ties

There are two largely distinct traditions in sociological research when it comes to social structure: (a) socioeconomic status or social class (b) social participation and social relations (N. Lin et al., 1999). These two structural forces have been shown to have impact a wide range of outcome variables including health and well-being (Aneshensel, 1992; N. Lin & Ensel, 1984; Pearlin, 1989). Individuals with higher social position or higher social class, and those with more social participations and social relations are associated with desirable outcome status. The results of these two camp studying different aspects of social structures

independently reveal that SES as well as social relationships are most consistently associated with better health and well-being.

Ironically, what has not been really clear is the relationship between these two structural variables. Given the consistent positive direction of association between these two structural variables and a wide range of outcome variables, it is not difficult to reason that there two factors are somewhat related and possibly influence each other in some way. However, it is not easy to examine the extent of relatedness between these two factors for several reasons: (a) the nature of flow may be bidirectional (b) the association may be different by the specific correspondence between the sub-type of each structural variable, or (c) the relatedness may depend on other social contexts. For example, Granovetter (1974) found that job search information is more effectively diffused through weak ties, which results in higher likelihood of landing job. This exemplifies a case in which the arrow goes from social ties (i.e., weak ties) to SES (i.e., employment). However, there is some evidence that it is also documented that higher education leads more social participations.

This study considers two structural factors together in predicting social isolation, because feelings of social isolation is formulated to be shaped by structural forces. In addition, this study also hypothesizes that the impact of SES on social isolation is operating through social ties. The rationale behind this formulation is that feelings of social isolation is more directly reflected by individuals' social relationships than by individuals' social standing. In other words, feelings of social isolation is more likely to arise when one's social ties are deficient but those poor social ties are likely to reflect lower social standing.

In sum, this section aims to examine the structural origins of social isolation. Socioeconomic standing promotes the ability to express oneself in a competitive social world

by enhancing human capital and increasing access to more resources. This in turn contributes to situations in which one can take part in fulfilling human interactions. Higher embeddedness then helps an individual avoid feelings of social isolation. Although the feeling of loneliness reflects our standing in unequal society, this negative affect may also interact with psychosocial resources that help us cope with stressful situations, which in turn may affect health negatively. Therefore, it is also important to develop theories aiming to show how social isolation might erode psychosocial resources and affect health negatively.

2.4. Psychosocial Processes and Health Consequences of Social Isolation

2.4.1. Social Isolation and Psychosocial Resources

Psychosocial resources, or self-perceptions are of primary concern to sociologists and psychologists for several reasons: (a) they serve to mediate the link between social location and health outcomes (b) they influence a wide range of social and behavioral outcomes (e.g., civic engagement, school failure), and (c) they are in their own right important indicators of psychological well-being. Psychosocial resources act not only as motivating forces but also as influences that structure beliefs and behaviors. Theories in social psychology identify several ways of constructing psychosocial resources (Rosenberg, 1981). Of key prominence is the concept of reflected appraisals: how people believe others perceive them (Cooley, 1902; Mead, 1934). The ability to mirror oneself with respect to other's perspective means human-beings are able to engage each other symbolically. This unique capacity may serve as important corner stone constructing different kinds of self-

perceptions or psychosocial resources. Conventionally the usage of this concept is generally limited to explaining self-esteem. Our own self-worth is largely shaped by how we think others perceive us. Positive reflected appraisal therefore leads one to possess high self-esteem thanks to warm and caring nature of relational environments one are likely to be embedded in. Likewise, reflected appraisal could arise with regard to not only the outcomes of interests that are set to be achieved, but also in the process of making efforts of achieving the outcomes. Similarly, one might have self-perception reflecting the extent of perceived availability regarding one's social network. The discussions linking three types of psychosocial resources (i.e., perceived support, personal mastery, and self-esteem) to social isolation are followed.

Social support commonly refers to the content of social relationships that explains the effects of social structure (i.e., social integration) on health and well-being. Possessing high levels of social support are likely to contribute to a range of better health outcomes with and without the presence of stressors. Past studies on social support have identified several types of social support: instrumental, informational, and emotional. *Instrumental support* involves the provision of material aid (e.g., financial assistance). *Informational support* refers to the provision of relevant information intended to help the individual cope with stressors (e.g., advice or guidance in the face of stressor). Lastly, *emotional support* involves the expression of empathy, caring, reassurance, and trust (House and Kahn 1985). In addition to these typologies, some research also distinguishes the nature of social support by received versus perceived (or anticipated) status. Among these different types of social support, this study focuses on perceived emotional support because the weight of health-protecting evidence is strongest in regard to *perceived emotional support* (Lin et al. 1999).

How might social isolation undermine perceived support? Social isolation is likely to damage perceived support for several reasons. First, this is likely because the state of social isolation may reflect a situation in which respondents are not able to appreciate the objective meaning (e.g., warmth and caring) embedded in social ties. Social isolation by definition refers to a state in which one feels lacking in personal interconnection or in which one does not have a confiding figure with whom to exchange support. Second, even though respondents may carry measurable social ties that would provide needed perceived emotional support, this support is likely to be filtered through the pessimistic lens of social isolation that either tones down positive gestures or exaggerates negative demand. Third, those who suffer from social isolation perhaps may have lived with poor social resources (e.g., low educational credentials along with poverty or a poor neighborhood) that make it more likely that they will have poor psychosocial resources, all of which contributes to high exposure to stressful situations and higher vulnerability to the effects of those stressors.

Personal mastery, self-efficacy, or a sense of control is marked by beliefs that one can control their life outcomes through their own actions (Ellison, 1993; Mirowsky & Ross, 2003b; T. Pudrovska et al., 2005). Part of this psychosocial resource involves viewing oneself with respect to the outcomes that one aims to achieve. Learning how to connect outcomes with efforts comprises one of the core elements of educational settings. Solving more and harder questions generally leads one to develop a higher sense of control that may be of use in a variety of social settings including occupations that demand creative and innovative thinking (J. Mirowsky & C. E. Ross, 2007). Living in a society that values human capital and competitiveness, active problem solving skills translates into access to more social resources and goods, which in turn results in better health outcomes. In this sense, Mirowsky and Ross

(2003) locate this construct as a core cross-cutting resource that links individuals' objective social conditions to emotional consequences.

Social isolation is also likely associated with a low level of sense of control. Although social isolation is rarely linked to poor sense of control, or sense of powerlessness, there are good reasons to believe that this connection exists. First, as emphasized earlier, social isolation is a product of objective social conditions reflecting poor social standing as well as unmet needs in interpersonal relationships (Mirowsky & Ross, 1998). All this implies lagging behind, narrowing opportunities and an escalating cost for catching up. It is extremely difficult to bounce back to the extent that a competitive society values. Second, the inability to achieve the goal in mind and getting used to those failures generally results in developing beliefs that things are out of one's own control and that there is no point in planning ahead or making significant efforts to realize a goal. In other words, individuals suffering from social isolation may not seek opportunities and connections that would otherwise help build confidence because their ability to self-express is significantly compromised. They tend to withdraw because of innately created false beliefs with respect to significant others or other relationships once meaningful to them.

Self-esteem is marked by individuals' beliefs about their own self-worth. One of the primary sources of high self-esteem comes from one's view of others who are positive and welcoming. Positive reflected appraisal thereby is a property reflecting interpersonal environments that are encouraging and constructive in nature as opposed to circumstances characterized by being critical, harsh, and demanding. It is not difficult to think about the situations in which hostile social environments decrease access to social resources or promote the 'dark side' of social relationships. As much as social integration facilitates potential for

supportive relationships, it may also contribute to increasing "constraints on freedom and autonomy, burdensome obligations, and dependency (p. 214, Mirowsky and Ross 2003)". As an economic situation gets tighter, the confiding relationship involved with said situation could quickly take a down-turn. As once-significant others become no longer significant and meaningful, we lose not only tangible opportunities to maintain meaningful personal attachment to significant figures, but also perceived welcoming spectators who would stand by our side.

2.4.2. Social Isolation and Health

The positive effect of social ties on health was documented in a seminal work by Durkheim ([1897] 1951). Later, a great deal of progress was made in the exploration of this link to the point where a causal relationship between social relationships and health was announced (House et al 1988). Even after this later work, interest in this line of research has continued to flourish and has made it possible to develop various pathways that may explain why social relationships are beneficial to health and contribute to longer life. A number of ideas and theories have been proposed and tested, which has advanced our understanding of how and why social relationships work for health. (Antonucci & Akiyama, 1995; Berkman & Glass, 2000; Cohen & Syme, 1985; Ellison, 1991; J. S. House, Umberson, et al., 1988; N. Lin et al., 1999; Pearlin et al., 1981) .

One of the consistent findings in this line of research is of the detrimental effects of social isolation on health (J.S. House, 2001). Social isolation has been consistently associated with negative health outcomes ranging from morbidity, mortality, and mental illness (Berkman, 1985; Berkman & Glass, 2000; Cacioppo & Hawkley, 2003; Kawachi &

Berkman, 2001; Rogers, Hummer, & Nam, 2000). In addition, social isolation is also predictive of psychological distress (Cohen, 2004). A number of stressors significantly contribute to the explanation of the variations in psychological well-being versus social relation. Umberson and colleagues (2006), for example, found that supportive relationships are associated with low levels of psychological distress, while strained relationships are associated with high levels of distress. Moreover, low social ties are associated with risk to cognitive functioning. Bassuk and colleagues (1999) found that the elderly who have no social ties were at increased risk for incident cognitive decline, after adjustment for individual characteristics (Bassuk, Glass, & Berkman, 1999).

Although the effects of various types of social isolation have been documented consistently as listed above, it has not been well-informed regarding whether the effects of social isolation on health is linear. In other words, it is less clear whether there exist *the threshold effects* of social isolation. This view asserts that social isolation is better described as a distinctive state in which social isolates are qualitatively distinguishable from others in terms of social relationship characteristics. Prospective studies typically adopt this idea and compare social isolates from general others for specific health outcomes of interest (e.g., (Barefoot et al., 2000)). While this prospective design is effective in determining how social isolation exerts an independent effect on health (typically after comprehensive adjustments), the criteria for cut-off points (e.g., determining who are social isolated) are rather arbitrary. For example, Brummett and colleagues (2001) define those with three or fewer individuals in their networks (i.e., similar to a number of close friends) as social isolates and others as non-isolates. They found that social isolates are more than twice as likely to face all-cause mortality relative to other groups in general. While the prospective designs successfully

demonstrate the powerful influence of social isolation on health, the effects of having no confidants and feeling lonely on health and mortality remain untested. The relative effects of confidant size and loneliness are empirical questions. It is still not clear whether arbitrary choices when defining social isolates versus others may lead to different conclusions or at least affect the strength of the findings.

Health consequences of social isolation are examined using two types of health outcomes: (a) depressive symptoms and (b) self-rated health. These health outcomes fit well with this study because they include documented correspondence of a wide range of social orders and account for the inherent subjective nature of an individual's assessment of their own health, considering that social isolation as defined in this study emphasizes the dual nature of social production and subjective self-perception. These health outcomes have been selected to tap the subjective quality of people's lives. First, depression is one of two major forms of distress, an unpleasant subjective state, along with anxiety (Mirowsky and Ross 2003). It has been well documented that the distribution of depression reflects social stratification. Moreover, conceptually, depression is distinct from alienation. According to Mirowsky and Ross, alienation (e.g., social isolation) is a state of mind and distress (e.g., depression) is a state of feeling. This distinction allows researchers to ask empirical questions regarding the extent of correspondence between the two. Second, self-rated health captures the conditions of individuals' health in a way that goes beyond objective health measures (e.g., life-threatening health conditions as well as nonfatal disease), is more broad and inclusive than specific measures of health or impairment (Idler & Benyamini, 1997), and is a stronger predictor of mortality than physician-assessed health (Mossey & Shapiro, 1982; Ross & Bird, 1994).

2.4.3. Psychosocial Resources as Mediators in the Link between Social Isolation and Health

With the theoretical expectation that social isolation impacts psychosocial resources as well as health, I also hypothesize that psychosocial processes mediate the impact of social isolation on health. This assertion indicates that the impact of social isolation on health is in part or totally operating through psychosocial resources, beyond and above objective social conditions. This is theoretically plausible for two reasons. First, social isolation and psychosocial resources may have been commonly shaped by the same social conditions and consequently these two variables are correlated each other at group level. Three types of psychosocial resources are best known to mediate the link between social conditions and health and wellbeing. If two types of social isolation are also highly influenced by social conditions, then it is likely that these two factors may be related inversely.

Second, there may be different levels of reflections by objective social conditions to psychosocial resources and social isolation (i.e., psychosocial demand). The gap between these two factors allows researchers to examine relative correspondence between these constructs. Similarly, the relative correspondence between the social isolation indicators and that of psychosocial resources offer researchers to examine its health consequences.

This specific correspondence between social isolation and psychosocial resources may be guided by distinct traditions on studying social structures. On the one hand, scholars who study the effect of SES emphasize a cognitive capability (e.g., personal mastery or self-esteem) as major pathways through which attained resources impact outcome variables. On the other hand, researchers who examine social relationships and health frequently rely on functional property (i.e., social support) for explaining the observed associations.

In sum, so far the discussions have centered on constructing two major facets that may operate in concert with social isolation: structural sources (SES and social ties, paths a, b, and c in Figure 1) and psychosocial resources and health (paths d, e, and f in Figure 1). In essence, this theoretical argument posits that feelings of social isolation may mirror poor social standing expressed through fewer interpersonal connections. The feelings of social isolation, in turn, interact closely with psychosocial resources, eroding our self-concept by damaging our view of ourselves with respect to others, our own self-worth, and our beliefs that connect our efforts to outcomes. All this interplay among social conditions, social isolation and psychosocial resources is expected to have consequences on an individual's health. In the meantime, how might social isolation play a role in one's ability to deal with stressful situations (path g in Figure 1) and in the operation of psychosocial resources in relation to health (path h in Figure 2)? The next section discusses psychosocial contexts in which social isolation acts as a stress-amplifier and resource-modifier.

2.5. Psychosocial Contexts of Social Isolation

2.5.1. Social Isolation within Stress Process Framework

The stress process framework provides an excellent angle through which we can examine how stressful situations get under one's skin (Pearlin, 1989; Pearlin et al., 1981). Current knowledge states that having more resources generally helps us fight against stressful situations. This approach has generated an extensive body of knowledge that shows how the whole cycle of stress is processed (Aneshensel, 1992; Thoits, 1995). Although it is an

excellent framework, the stress process model may lack an important component linking social conditions to health outcomes: psychosocial demand. In dealing with stressful situations, it has been proposed that only positive resources such as social support, personal mastery, and self-esteem serve as stress-buffers (Cohen & Syme, 1985; N. Lin et al., 1999; Turner & Marino, 1994). It is, however, equally possible that social isolation may act as a stress-amplifier in a way that accelerates the negative impact of stressors (Krause, 1987).

The stress process perspective does not directly include social isolation as one of its critical components (i.e., stressor, stress mediator, and stress manifestation). I argue that social isolation as a psychosocial demand may be placed between stressor and stress mediator in the framework. This addition is beneficial to the framework because it can now incorporate not only 'resources' that are used to fight against stress but also 'demand' that depletes resources in the face of stress or that inflates the impact of stressors. In essence, the psychosocial demand of social isolation acts like a 'cognitive moderator.' First, social isolation as a stress amplifier could elevate the impact of stressors. Second, social isolation could also attenuate the role of stress buffering resources. Thus, suffering from social isolation not only exaggerates the scope of stressors but also jeopardizes the coping resources that might otherwise offset the impact of stressors. Consequently, suffering from social isolation may lead to a double burden: one from the inflated stressor, and the other from deflated coping resources. This line of thought does not necessarily conflict with the stress process framework because the updated view allows researchers to formulate the stress process more flexibly, such that stress process could be amplified within certain social conditions, thereby resulting in an enrichment of the understanding of the processes by which stress might be amplified as opposed to buffered or mediated.

2.5.2. Social Isolation as Stress-amplifier

Social isolation may be particularly detrimental in the context of chronic stressors such as economic hardship. Economic hardship refers to situations in which individuals experience difficulties in paying bills and sustaining the basic needs of life, including food, clothing, housing and medical care (Pearlin et al., 1981). The adverse effects of economic difficulty on health have been well documented by prior research. Economic hardships have been strongly associated with psychological distress, poor physical health, and immature mortality (Krause, 1987; T. Pudrovska et al., 2005)

Given the strong link between economic hardships and health outcomes, the effects of economic hardships might be more detrimental among those experiencing social isolation. This is plausible for at least for two reasons. First, social isolation might block some of the potential assistance flowing from objective social ties, particularly the assistance which might come from significant others. The presence of social isolation implies that the meaning and warmth attached to those close personal networks may be undervalued if not totally ignored. Socially isolated individuals tend to misperceive perfectly normal situations as threatening or unpleasant. Krause (1991) found support for the prediction that experiencing economic strain generally leads to developing greater distrust of others, and that feelings of distrust in turn lead to greater isolation from strong ties. Second, individuals might decide not to seek assistance from significant others in the face of stressors because they fear potential stigmatizing or are embarrassed by the nature of the stressor. Therefore, it is expected that the impact of economic hardships might be more severe among individuals who are socially isolated.

2.5.3. Social Isolation as Resource-modifier

The potential salutary health consequences of personal mastery, self-esteem, and perceived support may be attenuated among socially isolated individuals. Not only does social isolation magnify the burden of chronic stressors, but is also weakens the stress-buffering capacity of protective resources. While not the most exciting hypothesis, it is worth examining in order to reveal how social isolation works in concert with other coping resources.

First, the health promoting effects of these psychosocial resources have been well documented (Aneshensel, 1992; Mirowsky & Ross, 2003b; Pearlin, 1989). Both as stress mediators and moderators, the distribution of these powerful psychosocial resources has explained many variations in health outcomes. Active problem solving, positive reflected appraisal, and favorable social comparisons have been named as factors explaining positive health outcomes. Additionally, low personal mastery, low self-worth, and negative network perception may activate some physiological stress response mechanisms (e.g., the HPA axis), which leads to the body responding as it would to a stressful situation, and thus to poor health (Berkman & Glass, 2000; Berkman & Kawachi, 2000; Foster, Hagan, & Brooks-Gunn, 2008; Kunz-Ebrecht et al., 2004).

Second, perhaps the difference in effectiveness of these coping resources on health outcomes may be further explained by the state of social isolation. Perceived detachment from significant others may hinder the process through which perceived emotional support operates to protect health; the feeling of deficiency or of not being able to fit in within an organization may discourage effective use of active problem solving skills, which might allow stress proliferation to occur (Pearlin, 1989; Thoits, 1995). Furthermore, negative

reflected appraisal and generally hostile environmental contexts, resulting from a manipulated self-view may increase the secretion of stress hormones such as glucocorticoid (Krueger & Chang, 2008; Kunz-Ebrecht et al., 2004; Thoits, 1995).

In sum, I suggest that social isolation may play an important role in the stress process framework by acting as a 'stress amplifier' inflating the effect of stressors and as a 'cognitive modifier' reducing the effectiveness of the key psychosocial resources on health. Enhancing the pre-existing views and knowledge that allow us to study the detrimental consequences of social isolation is indeed a needed task. In that regard, this chapter theorizes on and deepens the stress process framework so that it not only addresses the positive or lack of positive role of resources but also takes into account the negative or lack of negative role of demands that may not have yet received adequate research attention. Identifying and documenting the less-studied role of social isolation within the stress process framework may lead us to take a more balanced approach in understanding how stress gets under the skin.

2.6. Summary of Research Questions and Hypotheses

2.6.1. SES, Social Ties, and Social Isolation

The first empirical chapter examines the structural antecedents of social isolation. The primary goal is to explore how social conditions (i.e., socioeconomic status and social ties) lead to social isolation. This chapter examines paths a, b, and c in Figure 1:

Research Question 1: Does SES predict social ties? (path a in Figure 1)

Hypothesis 1: Individuals with higher SES will report higher levels of community ties than individuals with lower SES

Hypothesis 2: Individuals with higher SES will report higher levels of social network ties than individuals with lower SES counterparts

Hypothesis 3: Individuals with higher SES will report higher levels of intimate ties compared to individuals with lower SES

Research Question 2: Does SES predict social isolation? (path b in Figure 1)

Hypothesis 1: Individuals with low SES will be more likely to report no confidant than their high-SES counterparts

Hypothesis 2: Individuals with low SES will be more likely to report feeling lonely compared to individuals with higher SES

Research Question 3: Do social ties predict social isolation? (path c in Figure 1)

Hypothesis 1: Individuals with fewer social ties will be more likely to report no confidant compared to individuals with more social ties

Hypothesis 2: Individuals with fewer social ties will be more likely to report feeling lonely compared to individuals with more social ties

Research Question 4: Do social ties mediate the effect of SES on social isolation? (paths a, b, and c in Figure 1)

Hypothesis 1: Social ties will partly mediate the effect of SES on having no confidant

Hypothesis 2: Social ties will partly mediate the effect of SES on loneliness

2.6.2. Social Isolation, Psychosocial Resources, and Health

The second empirical chapter examines the relationships between social isolation, psychosocial resources, and health. This chapter examines paths d, e, and f in Figure 1:

Research Question 1: Does social isolation predict low levels of psychosocial resources? (path d in Figure 1)

Hypothesis 1: Individuals with high levels of social isolation will report lower levels of perceived support

Hypothesis 2: Individuals with high levels of social isolation will report lower levels of personal mastery

Hypothesis 3: Individuals with high levels of social isolation will report lower levels of self-esteem

Research Question 2: Does social isolation predict poor self-rated health and depressive symptoms after controlling for SES and social ties? (path e in Figure 1)

Hypothesis 1: Net of SES and social ties, individuals who report no confidant or feelings of loneliness will report worse self–rated health than persons who are not socially isolated

Hypothesis 2: Net of SES and social ties, individuals who report no confidant or feelings of loneliness will report more depressive symptoms than persons who are not socially isolated

Research Question 3: To what extent is the effect of social isolation on health mediated by psychosocial resources? (paths d, e, and f in Figure 1)

Hypothesis 1: Individuals with higher levels of psychosocial resources will report better self-rated health than their counterparts with lower levels of personal mastery, self-esteem, and perceived support

Hypothesis 2: The effect of social isolation on self-rated health will be partly mediated by psychosocial resources

Hypothesis 3: Individuals with higher psychosocial resources will report fewer depressive symptoms relative to those with lower levels of psychosocial resources

Hypothesis 4: The effect of social isolation on depressive symptoms will be mediated by psychosocial resources

2.6.3. Psychosocial Contexts of Social Isolation

The third empirical chapter investigates the role of social isolation in amplifying the impact of chronic stressors and decreasing the impact of psychosocial resources on self-rated health. This chapter examines paths g and h in Figure 1:

Research Question 1: Is the effect of chronic stressors on health amplified by social isolation? (path g in Figure 1)

Hypothesis 1: The impact of economic hardship on self-rated health is more detrimental among individuals with no confidant relative to individuals who report having confidants

Hypothesis 2: The impact of economic hardship on self-rated health is more detrimental among individuals who feel lonely relative to individuals who do not feel lonely

Research Question 2: Does social isolation attenuate the positive effect of psychosocial resources on health? (path h in Figure 1)

Hypothesis 1: The positive impact of psychosocial resources on self-rated health is weaker among individuals with no confidant

Hypothesis 2: The positive impact of psychosocial resources on self-rated health is weaker among individuals who experience loneliness

CHAPTER 3. DATA AND METHODS

3. 1. DATA

This study employs data from the nationally representative four-wave panel "Americans' Changing Lives," (ACL) survey. The survey data was collected by the Survey Research Center at the University of Michigan using a multistage stratified area probability sample. The universe consists of households within the continental United States. Individuals age 25 or older were included with an oversampling of African Americans and those aged 60 and older. The survey was conducted in 1986, 1989, 1994, and 2002 (James S House, 2007). In the first panel 3,617 individuals were interviewed. A series of attempts were made to re-interview the same respondents and 2,867, 2,398, and 1,692 responses were collected in Wave 2, Wave 3, and Wave 4, respectively.

ACL is a rich dataset that contains various measures of social life. In particular, it contains a variety of social relationships and health outcome measures and therefore allows me to examine links between complex aspects of social relationships and ways in which they affects health and well-being. Moreover, ACL is a panel study that covers 16 years of period with four different measurements point. Although an additional wave of information has been collected recently, it has not been available to the public yet. In order to take a full advantage of rich information collected, all four waves are used in the analyses.

Although most questions in ACL survey have been retained and re-asked across all four waves, some variables are only measured in the first two waves. Detailed information regarding the availability of specific variables will be provided in the next section.

3. 2. MEASURES

3.2.1. Focal Predictors

Social isolation is assessed as two variables reflecting its two conceptual components. *The "confidant isolation" component* is based on the following question: "Thinking of all your family and friends, including your spouse/ partner, child(ren) and parents, is there anyone in your life with whom you can really share your very private feelings and concerns?" Participants who responded "No" to this question are coded 1 (no confidant), and those who responded "Yes" are coded 0 (at least one confidant). Respondents who answered "Yes" were further asked the number of persons. *The "loneliness" component* is based on one item from the Center for Epidemiological Studies Depression Scale that asked respondents how often in the last week they felt lonely (hardly ever, some of the time, or most of time). A dummy variable will be created where 1=loneliness (most of the time) and 0=otherwise. Both social isolation variables are measured in all four ACL waves.

3.2.2. Focal Outcomes

Depressive symptoms are measured with the Center for Epidemiological Studies Depression Scale (CES-D). The 11-item instrument is available in the ACL; however, only 10 items (excluding "I felt lonely") will be used in this study. Respondents were asked to respond to the following statements: "In the past week, I felt that everything I did was an effort." "My sleep was restless." "I was happy." "People were unfriendly." "I enjoyed life." "I did not feel like eating." "I felt sad." "I felt that people disliked me." "I couldn't get going." "I felt depressed." Response categories were as follows: 1=hardly ever, 2=some of the time, 3=most of the time. Responses to two positive items (happy, enjoy) will be

reversely coded so that higher values indicate a more depressed mood. This variable will be measured in all four waves. The reliability test of the total 10-item CES-D scale for each wave yields an alpha coefficient as follows: Wave 1= .81; Wave 2=.80; Wave 3=.80; and Wave 4=.80. *Self-rated health* will reflect how respondents rated their health at the time of the interview on a five-point scale. Respondents were asked how they would rate their health at the present time. The response categories were as follows: 5=excellent; 4=very good; 3=good, 2=fair; and 1=poor. A higher score indicates better health. This variable will be measured in all four waves.

3.2.3. Social Ties

Community Ties. This measure will be constructed by tapping the frequency with which respondents attended meetings and the frequency with which respondents attended church services. This measure will reflect a respondent's involvement in community activities. Respondents were asked, "How often do you attend meetings or programs of groups, clubs, or organizations that you belong to?" and "How often do you attend religious services?" Response categories were as follows: 1=more than once a week, 2=once a week, 3=2 or 3 times a month, 4=about once a month, 5=less than once a month, 6=never. An index variable will be created by averaging the two items. Answers will then be recoded so that higher values represent more community involvement. This variable will be measured in all four waves. The reliability test of community ties scale for each Wave yields an alpha coefficient of: Wave 1=.57; Wave 2=.56; Wave 3=.58; and Wave 4=.60.

Social Network Ties. Frequency of weekly contacts and frequency of weekly phone conversations will measure interpersonal networks ties. Respondents were asked, "How often

do you get together with friends, neighbors or relatives and do things like go out together or visit in each other's homes?" and "How many times do you talk on the telephone with friends, neighbors or relatives?" Response categories were as follows: 1=more than once a week, 2=once a week, 3=2 or 3 times a month, 4=about once a month, 5=less than once a month, 6=never. Again, the two items will be averaged and recoded so that the higher values represent more social networks ties. This variable will be measured in all four waves. The reliability test of intermediate ties scale for each Wave yields an alpha coefficient of: Wave 1=.45; Wave 2=.43; Wave 3=.50; and Wave 4=.51.

Intimate Ties. This item will be constructed so that 1=married or living with a partner and 0=otherwise. Two questions will be used to construct intimate ties. First one is a dummy variable indicating a married status. Second question is asked to those who were currently not married, "Are you currently living with another adult as a partner in an intimate relationship?" Those who responded "Yes" to either question are coded 1 and others are coded 0. This variable will be measured in all four waves.

3.2.4. Psychosocial Resources

Perceived support. Perceived support will be measured in terms of perceived levels of support from friends/relatives. Respondents were asked the following questions: "How much does your friends/relative make you feel loved and cared for?" and "How much is (he/she) willing to listen when you need to talk about your worries or problems?" Responses were categorized as follows: 1=great deal, 2=quite a bit, 3=some, 4=little, 5=not at all. An index variable of perceived support will be created by averaging the two items. Answers will be recoded so that higher values represent more positive support. This variable is time-varying

and is measured in all four waves. The reliability test of positive support scale for each Wave yields an alpha coefficient of: Wave 1=.72; Wave 2=.73; Wave 3=.79; and Wave 4=.77.

Self-esteem. Respondents were asked how much they agree with the following three statements: (1) "I take a positive attitude toward myself." (2) "At times I think I am no good at all." (3) "All in all, I am inclined to feel that I am a failure." Response categories for each item included: 1= strongly agree, 2=agree somewhat, 3=disagree somewhat, and 4=strongly disagree. Three items will be recoded to ensure that higher scores reflect greater self-esteem. They will be summed to create the index. This variable will be measured in all four waves. The reliability test of self-esteem scale for each wave yields an alpha coefficient of: Wave 1=.57; Wave 2=.60; Wave 3=.58; and Wave 4=.58.

Personal Mastery. Mastery will also be gauged with a three-item index. The response scale and summation method are same as *Self-esteem* and the scores will be based on the respondents' agreement or disagreement with the following two statements: (1) "Sometimes I feel that I am being pushed around in life." (2) "There is really no way I can solve the problems I have." This variable will be measured in all four waves. The reliability test of personal mastery scale for each Wave yields an alpha coefficient of: Wave 1=.50; Wave 2=.50; Wave 3=.45; and Wave 4=.46.

3.2.5. Chronic Stressors

Economic Hardships. Respondents were asked the degree of financial difficulty with two items of financial satisfaction and difficulty in paying bills. Response categories ranging from 1 to 5 are rearranged to ensure that higher score reflected more economic hardships. This variable is standardized.

3.2.6. Socioeconomic Status

Education level will be a continuous measure of highest grade completed. An ordinal *household income* measure containing 10 categories will be used. The range will be coded as follows: 1=Less than $5,000; 2=$5-$9,999; 3=$10,000-$14,999; 4=$15,000-$19,999; 5=$20,000-$24,999; 6=$25,000-$29,999; 7=$30,000-$39,999; 8=$40,000-$59,999; 9=$60,000-$79,999; 10=$80,000 or more. This variable will be measured in all four waves. *Employment status* will be a dummy variable where 1=currently employed and 0=not currently employed. These variables will be measured in all four waves.

3.2.7. Control Variables

Age will be measured in years. *Gender* will be a dummy variable with male equal to 0 and female equal to 1. *Race* will be a dummy variable where Black=1 and otherwise=0. *Chronic Health Problems* will be measured by counting the presence of 10 chronic conditions during the last 12 month, which is then top-coded at 7 or more. (e.g., lung disease, stroke, heart attack, cancer, or diabetes). In addition, *four waves* of panel data will be classified with four dummy variables representing each wave.

3.2.8. Sample Attrition Variables

Attrition patterns will be classified with a series of dummy variables that will indicate attrition in each wave (Hedeker & Gibbons, 1997). Five dummy variables will be used to account for attrition according to the following patterns: att1=no attrition across all waves; att2=responded up to Wave 3; att3=completed responses up to Wave 2; att4=responded in Wave 1; att5=intermittently responded.

3.3. METHODS

3.3.1. Statistical Models

To examine the health implications of social isolation over time the data will be constructed as a long (or person-period) form where each respondent contributes as little as one case and as many as four cases to the data. Random effects regression models will be used to account for the fact that the same individuals are measured more than once in this study design. Both random-effect linear and logit models will be used. For the former, this is characterized as a two-level random-coefficient model with time measurement occasions (level-1 units) nested within individual (level-2 units) and is used to model continuous response variables including health outcomes, (depression and self-rated health), social ties (community ties and social network ties), and psychosocial resources (perceived support, personal mastery, and self-esteem).

The model for the continuous health outcome Y_{ij} of time (wave) i with respondent j is specified as:

$$Y_{ij} = \beta_1 \quad + \beta_2 x_{1ij} + \beta_3 x_{2ij} + \ldots + \zeta_j + \varepsilon_{ij}, \qquad (1)$$

where β_1 is a fixed intercept, β_2 and β_3 are coefficient for covariates, ζ_j is a random intercept (level 2) and ε_{ij} is a level 1 error. This model assumes:

$\varepsilon_{ij} \sim N(0, s^2)$

$\zeta_j \sim N(0, t^2)$

For the latter, this is also described as a two-level random intercept model with measurement occasions (level-1 units) nested within individual (level-2 units) where the logit of the probability of isolation is the response variable. The following equation will be used to

model binary outcome variables including social isolation (no confidant, loneliness) and intimate ties.

$$\text{Logit } [\Pr(Y_{ij}=1)] = \beta_1 \quad +\beta_2 x_{1ij} + \beta_3 x_{2ij} + \ldots + \zeta_{j,}, \qquad (2)$$

where β_1 is a fixed intercept, β_2 and β_3 are coefficient for covariates, and ζ_j is a random intercept (level 2). Unlike the linear model, the level 1 residual has a mean of 0 and fixed variance is not estimated. The logit model assumes:

$\zeta_j \sim N(0, t^2)$

All models were estimated as random intercept models using Stata 13 (Stata Corp).

3.3.2. Incomplete Data

Three types of missingness have been identified as *ignorable nonresponse* in longitudinal data (Larid 1988; Little 1995; Little & Rubin 1989; Singer and Willet 2003): (1) missing completely at random (MCAR), (2) covariate dependent dropout (CDD), and (3) missing at random (MAR). If types of missingness are non-ignorable, then two different strategies called *selection models* and *pattern mixture models* are suggested to correct the missingness assumptions (Singer and Willet 2003). First, missing data are missing completely at random (MCAR) if the distribution of missingness does not depend on any observed or missing data including the value of predictors and the value of outcome. Second, covariate dependent dropout (CDD) allows association between the probability of missingness and observed predictor but not between missingness and the outcome variable. Third, the MAR assumption is the least restrictive assumption among ignorable nonresponse. When data are MAR, the likelihood of missingness can be associated with any observed data

including either the predictors or any outcome values. It cannot, however, be associated with any *unobserved* value of either any predictor or the outcome (Singer and Willet 2003: 158).

Among three types of missingness, MAR is regarded as the least restrictive assumption primarily because it allows missingness to be associated with any observed variables. Other two assumptions –MCAR and CDD-- require that the outcome value is not associated with missing values. Given the nature of outcome variables employed in the current project – confidant isolation and health outcomes, it is reasonable to assume that the missingness is somewhat related to the outcome variables—those who feel less healthy and more isolated are prone to leave survey. In fact, Table 1 shows the isolation status is modestly associated with missing data patterns. This condition alone suggests that the only credible assumption is MAR.

In order to address issues of sampling attrition in ACL, an attempt is made to correct the extent of bias stemming from non-ignorable missing pattern or missing not at random (MNAR). An approach known as pattern-mixture modeling s proposed to handle attrition in random-effect models for longitudinal data (Hedeker & Gibbons, 1997). Following Hedeker and Gibbons (1997), a series of dummy variables are created based on missing-data patterns and are used as covariates in all multivariate models.

3.3.3. Weighting

The ACL data manual recommends researchers to use the given sampling weights in an effort to adjust for over-sampled populations in each wave (James S House, 2007). ACL, however, does not provide a proper weight variable for multilevel analysis. Typically a longitudinal study employs multilevel modeling where time points are nested within a

subject. Using a sampling weight in a multilevel analysis requires a weight variable for each level but the provided weighting variables cover only the lower level of the hierarchy (i.e, level-1 in a longitudinal model). To address this issue, I have constructed data that theoretically represent the sampling frame of the design.[2] Consequently, the data no longer require applying weights. The sensitivity analyses show that (a) descriptive statistics using the two sets of data, one constructed and the other given but without using weights are quite similar or comparable, and (b) excellent replication of the key multivariate findings reported in the results section. Any noticeable discrepancy, however, is identified in the corresponding results section. As for the descriptive and correlation tables, the given sampling weight variable is applied to represent the sampling frame.

[2] Essentially, the whole process is a way of replicating the sample using given wave specific sampling weight. First, the sample is expanded to the population level using four wave specific weighting variables. Second, the expanded sample now needs to be random-sampled to the Wave 1 sample size. Third, the newly constructed data are now ready to be transformed into the long form.

CHAPTER 4. SES, SOCIAL TIES, AND SOCIAL ISOLATION

4.1. INTRODUCTION

This chapter examines the effect of SES and social ties on social isolation, and consists of three parts: the effect of SES and social ties (Section 4.2.2), the effects of SES and social ties on social isolation (Section 4.2.3), and the mediating role of social ties in the association between SES and social isolation (Section 4.2.4.). After presenting descriptive statistics (Section 4.2.1), the multivariate results are discussed according to research questions and specific research hypotheses stated in Chapter 2 (Section 2.6.1).

4.2. RESULTS

4.2.1. Descriptive Analyses

Table 7.1 presents descriptive statistics of variables employed in this study, and the statistics are also presented by the social isolation status. Thus, the first two columns report results by no confidant status, and the last two by loneliness status. As noted in Chapter 2, each entry is weighted to represent the U.S. population in 1986. Table 7.2 reports the correlation matrix among the variables. According to Table 7.1, the mean age of respondent is 47 years old in 1986. 53% of respondent are female, and 11% of them are black. Average socioeconomic attainment of respondents is of 12.37 years of education, 66% are employed, and with a mean of 5.33 on household income out of 1-10 scale, where 5=$20.000-$24,999

and 6=$25,000-$29,999. With respect to prevalence of social isolation, 12% of respondent reports no confidant and 5% loneliness.

4.2.2. Research Question 1: Does SES predict social ties?

I use random intercept linear models for continuous outcomes and random intercept logit models for binary outcome to test hypotheses. Tables 7.3, 7.4, and 7.5 report the estimated association between each of three social ties (i.e., community ties, social network ties, and intimate ties) and SES, respectively. All models are controlling for time (wave), attrition patterns, and chronic illnesses but their estimates are not shown in the tables. Tables presented here are made up of five models where the first model serves as the baseline and tthe subsequent models add education, employment, and family income individually, and the full model includes all three items simultaneously.

Hypothesis 1: Individuals with higher SES will report higher levels of community ties than individuals with lower SES

As shown in Table 7.3, the effect of education on community ties is significant (.063, $p<.001$) in Model 2. Adjustment for employment and household income in Model 5 reduces the size of coefficient for education from 0.63 to .054, or by 14%, although the effect remains statistically significant. The effect of employment is not significant (-.030, ns) in Model 1 but becomes significant (-.079, $p<.05$) in Model 5, suggesting that the effect of employment is slightly suppressed by other SES items. The effect of family income on community tie is fairly robust (.038, $p<.001$) alone and stays such (.030, $p<.001$) in the full model, suggesting that having more financial assets helps to build community ties beyond and above education and employment. In addition to the results from the individual coefficients, I also report

model fit criteria at the bottom of each Tables. Among three statistics, I interpret overall R squared here due to the mixture of level of SES—education is a level 1 variable, and employment and household income are level 2 variables. According to overall R squared, the explained proportion of combined variance components, education accounts for an additional 1.5%, household income an additional 1.0%, and employment 0.0%, relative to the proportion that baseline predictors have explained in Model 1, which is 2.6%. This result indicates that the effect of education is greatest next to that of household income, and the effect of employment is trivial in explaining variation. Taken together, the relationship between SES and community ties is mixed. On the one hand, both education and household income do seem to help build more community ties. On the other hand, employment does not actively cultivate community ties alone and even seems to reduce community level participation when the effects of education and family income are taken into account together. This is not surprising because the zero order correlation between community ties and employment is negative and significant (r=-.018, $p < 05$), according to the correlation coefficients reported in Table 7.2.

Hypothesis 2: Individuals with higher SES will report higher levels of social network ties than individuals with lower SES counterparts

The effect of SES on social network ties is presented in Table 7.4. The effect of education on social network ties is positive and significant (.068, $p < .001$) in Model 2. Controlling for employment and household income in Model 5 slightly elevates the coefficient for education from .068 to .072 with the effect remaining statistically significant at the .001 level. The effect of employment on social networks is strong and negative (-.162, $p < .001$) in Model 3 and the negative association gets even stronger, suggesting some modest

suppressing effect of employment by other SES items. The effect of household income on social network ties is significant and positive (.012, $p < .05$) in Model 4 but becomes non significant (-.003, ns) in Model 5. The extent of association between three indicators of SES and social network ties is also reflected in the model fit criteria. The relative increment of overall R squared from the baseline is much greater for education (2.7%) than for household income (0.3%). There is only a.1% increment reported for employment. Taken together, the relationship between SES and social network ties is not straightforward: The positive effect of education stands out; negative effect of employment is substantial; and the effect of household income is not robust. The suppressing effect of employment is found consistently across the various social ties.

Hypothesis 3: Individuals with higher SES will report higher levels of intimate tie compared to individuals with lower SES

Table 7.5 indicates that the effect of education is strong and positive (.154, $p<.001$) in Model 2. The direction of the association is, however, reversed from positive to negative while maintaining statistical significance level at $p<.001$ in Model 5. The effect of employment is non-significant (-.113, ns) in Model 3 yet it switches to strong negative (-1.467, $p<.001$) in Model 5. The effect of household income is positive and strong in Model 1 (.892, $p<.001$) and is even slightly enhanced in Model 5 (1.009, $p<.001$). The model fit criteria (AIC) provide addition information to the association of interests. The lowest fit criteria is found when the household income is estimated (7567), and followed by education (8522) and employment (8527), indicating that household income plays dominant role among SES indicators in predicting intimate ties.

4.2.3. Research Question 2: Does SES predict social isolation?

Analyses now move on to assess how/whether SES and social ties affect social isolation. Tables 7.6 and 7.7 present the results estimating the net effects of socioeconomic attainment and social ties on social isolation using random intercept logit models. The research expectation is that both SES and social ties are independently associated with feelings of social isolation yet the effect of social standing on social isolation is explained by various ways of social connectedness.

Hypothesis 1: Individuals with low SES will be more likely to report no confidant than their high-SES counterparts

Following baseline Model 1 that shows the net effect of demographic variables, Models 2-5 in Table 7.6 report the associations between SES and the absence of a confidant. According to Models 2 through 4, the estimated individual effects (logistic regression coefficients) of education, employment, and household income on no confidant are -.083, -.611, -.127 all at the .001 level. In Model 5, the net effects of each SES item are reduced substantially into -.045 at .the 05 level, -.444 at the .001 level, and -.088 at the .001 level, respectively. The comparison between Models 2 through 4 and Model 5 shows that the effect of each SES item are significant yet related in predicting no confidant. Nevertheless, each of SES indicators still exercises an independent effect on no confidant when they are assessed simultaneously.

Hypothesis 2: Individuals with low SES will be more likely to report feeling lonely compared to individuals with higher SES

According to Model 2 through Model 4 in Table 7.7, each item of socioeconomic status is associated with loneliness negatively and significantly, which mean each of SES

indicators predicts the outcome variable significantly without being considered the effect of other SES indicators. The magnitudes of each coefficient drop from -.131 to -.078, or by 40% for education, from -.650 to -.385, or by 41% for employment, and from -.188 to -.135, or by 28% for household income. For these associations, the statistical significance level remains same at .001 level, although that of employment reduces to .01 level in Model 5. This means that the way these three elements of SES fight against feeling of loneliness are significantly related but even then each factor still predicts loneliness independently when three indicators are estimated together. The relative effect of SES components, according to AIC criteria, is highest to lowest with the order of Household income (3812), education (3836), and employment (3856).

4.2.4. Research Question 3: Do social ties predict social isolation?

Hypothesis 1: Individuals with fewer social ties will be more likely to report no confidant compared to individuals with more social ties

Models 6 through 9 report the association between social ties and no confidant, net of SES. According to Model 6 through Model 8, each social tie type predicts the outcome variable significantly (.090 at $p < .01$ level for community ties, -.269 at $p < .001$ level for social network ties, and -.694 at $p < .001$ level for intimate ties). In Model 9, the estimated net effects of each social ties are somewhat affected where the net effect of community ties dropped to .029 (ns), the sign of mediation, and that of social network ties and intimate ties slightly increased to -.292 and -.780, the sign of suppression, respectively, with each of effect maintaining the same significance level.

Hypothesis 2: Individuals with fewer social ties will be more likely to report feeling lonely compared to individuals with more social ties

The net effects of structural social ties on loneliness are estimated in Model 6 through Model 9, after controlling for SES. The effects of community ties (-.236, p<.001), social network ties (-.168, p<.001), and intimate ties (-.1.061, p<.001) are all statistically significant and negative on sense of loneliness. When three types of social ties are estimated together in Model 9, the coefficients of each social ties change as follows: Community ties (-.207, p<.001), social network ties (-.175, p<.001), and intimate ties (-1.158, p<.001). Just as no confidant model, the effect of community ties is somewhat reduced while other two effects slightly elevate.

4.2.5. Research Question 4: Do social ties mediate the effect of SES on social isolation?

Hypothesis 1: Social ties will partly mediate the effect of SES on having no confidant

The analyses now turns to determining the mediating role of social ties. First, adjustment of community ties in Model 6 does not change the coefficients of SES in a meaningful way. The coefficients of SES in Model 5 are virtually unchanged in Model 6. Second, in Model 7, adding social network variables to the list of variables estimated in Model 5, fails to produce significant changes to employment and household income, but does explain the beneficial effect of education on the outcome variable. The coefficient of education (-.045, p<.05) in Model, drops and loses significance (-.025, ns) in Model 7, indicating a mediating role of social network ties in the link of education and no confidant. Third, Model 8 reports the result on how/whether intimate ties explains the link of SES – no

confidant. Adjusting for intimate ties in slightly intensifying the coefficient for education and employment (-.057 at $p < .001$ level for education and -.517 at $p < .001$ level for employment) and losing the magnitude and statistical significance for family income (-.032, ns). This change indicates the suppressing effect of intimate ties, to the less extent though, on education and employment, and the complete medication effect on household income. Fourth, Model 9, adjusting for three types of social ties simultaneously, presents results on the mediating role of social ties on the effect of SES on the outcome variable. Taking into account the three types of social ties simultaneously changes the net effect of education from -.045 from -.037, or a 17% reduction, and that of household income from -.088 to -.020, or 77% reduction with statistical non significance, and that of employment from -.444 to -.581, or 31% increase.

Hypothesis 2: Social ties will partly mediate the effect of SES on loneliness

In Model 6, the net effect of community ties does not produce any meaningful change to the association between SES and loneliness. Next, in Model 7, social network ties decreases the size of education coefficient by 17% and increases employment coefficient by 7%. Third, in Model 8, the effect of intimate ties boosts the coefficient of employment by 32% (with significance level changing from .001 to .01) but decreases that of household income by 65% (with significance level changes from .001 to non-significant.). Finally, controlling for all three social ties does not cause any significant change on education but increases the coefficient of employment by 39% and decreases that of household income by 75% in Model 9.

4.3. Summary of Key Findings

First, with respect to the first research question (i.e., does SES predict social ties?), the results are mixed: education is positively associated with social ties; employment is not associated with social ties; household income is positively associated with social ties. Second, with respect to the second research question (i.e., does SES predict social isolation?), the results indicate that education, employment, and household income are negatively associated with both types of social isolation. Third, with regard to third research question (i.e., do social ties predict social isolation?), all three types of social ties (community, network, and intimate) are negatively associated with social isolation, although the magnitude of these associations varies. Finally, in relation to the fourth research question (i.e., do social ties mediate the effect of SES on social isolation?), the evidence for the mediating role of social ties in the association between SES and social isolation is mixed.

CHAPTER 5. SOCIAL ISOLATION, PSYCHOSOCIAL RESOURCES, AND HEALTH

5.1. INTRODUCTION

This chapter examines the effect of social isolation on psychosocial resources (i.e., section 5.2.1.) and on health (section 5.2.2.) and psychosocial pathways through which social isolation impacts health (section 5.2.3.). This part of dissertation is organized by answering three research questions presented in section 2.6.1. in Chapter 2. Because the role of social conditions in producing social isolation is examined in the first empirical chapter, analyses in current chapter control for those structural factors (i.e., SES and social ties). Therefore, the results presented here reports the estimated effects of social isolation on psychosocial resources and health, when the effects of those objective social conditions are held constant. Do social isolation affect psychosocial resources beyond and above social conditions? Does the impact of social isolation on health largely operate through psychosocial resources? Is there independent effect of social isolation on health that goes beyond psychosocial resources and objective social conditions? The results below provide empirical evidence for these questions.

This chapter considers two types of health outcomes to test the robustness of results: self-rated health and depressive symptoms. One of social isolation indicator used in the analysis, loneliness, is one of items constructing CESD measure. This may be problematic. Therefore, only one social isolation indicator, no confidant, is used as a predictor in Table 7.12, when the dependent variable is depressive symptoms. For self-rated health outcome, both no confidant and loneliness are used as predictors.

5.2. RESULTS

5.2.1. Research Question 1: Does social isolation predict low levels of psychosocial resources?

Tables 7.8, 7.9, and 7.10 present a series of random intercept models estimating the effect of social isolation on three types of psychosocial resources. These Tables are constructed with 4 models where the first model serves as a baseline model, the next 2 models estimate the effect of two types of social isolation individually, and the last model estimates the effect of both predictors together.

Hypothesis 1: Individuals with high levels of social isolation will report lower levels of perceived support

First, Table 7.8 reports the association between social isolation and perceived social support. According to Model 2 and Model 3, the effects of both no confidant (-.372, p<.001) and loneliness (-.186, p<.001) are negative and significant. According to Model 4, the net effect of both variables remains virtually the same (-.369 at p < .001 level for no confidant, -.170 at p < .001 level for loneliness), suggesting that these factors are not related in predicting the outcome variable. The fact that social isolation exerts an independent effect on perceived support net of objective structural variables suggests the possibility that the perception of social isolation may undermine the self-view regarding potential positive support from others. In addition, the fact that these two types of social isolation are not related in predicting perceived support demonstrates and presents evidence that they are distinct constructs in relation to perceived positive support, which will be tested subsequently

with respect to other self-concepts. Model fit statistics of Level 2 R-squared provide strong support that these two constructs of social isolation are indeed significant predictors that improve explanatory power. Relative to the baseline model (Model 1), adding no confidant to the model improve the explained portion of level 2 variance by 6.5% and loneliness by 1.7%.

Hypothesis 2: Individuals with high levels of social isolation will report lower levels of personal mastery

Table 7.9 reports the association between social isolation and personal mastery. According to Model 2 and Model 3, the effect of no confidant (-.203, p<.001) and that of loneliness (-.482, p<.001) are negative and statistically significant. These coefficients are not affected significantly (-.194 at p < .001 level for no confidant, and -.474 at p < .001 level for loneliness) when they are estimated together in Model 7, suggesting that the variables of no confidant and loneliness are not related in predicting personal mastery. The Level 2 R-squared for Model 2 and Model 3 increased 1.4% and 4.4%, respectively, relative to Model 1, baseline model. As in the case of perceived support, the relationship of the two aspects of social isolation with personal mastery seems to be independent. Although both no confidant and loneliness share negative association with personal mastery, the way one facet of social isolation affects personal mastery level does not affect how the other facet influences it, which is consistent with the pattern observed for the sub-types of social isolation with respect to perceived support.

Hypothesis 3: Individuals with high levels of social isolation will report lower levels of self-esteem

Table 7.10 reports the estimated effect of social isolation on self-esteem. According to Model 1 to Model 4, the effect of no confidant on personal mastery remains quite similar

with and without loneliness being controlled for (-.228 to -.216, both at the .001 level), and the effect of loneliness follows the same pattern (-.614 to -.605, both at the .001 level). This pattern of independent effects of two subtypes of social isolation has been observed consistently in the previous two outcome variables. The results once again confirm that no confidant and loneliness are two different constructs with respect to self-regard but nevertheless share the commonality of maintaining the significant negative association.

5.2.2. Research Question 2: Does social isolation predict poor self-rated health and depressive symptoms after controlling for SES and social ties?

Table 7.11 reports the effect of social isolation and psychosocial resources on self-rated health, and Table 7.12 on depressive symptoms. Each tables is constructed in a way to estimate the effects of (a) social isolation (Model 1 to Mode 3), (b) psychosocial resources (Model 4 to Model 7 in self-rated health and Model 4 to Model 6 in depressive symptoms), and (c) psychosocial resource in its mediating role in the link between social isolation and two types of health outcomes. Note that depression model of Table 7.12 is fitted without loneliness as a predictor due to the potential bias related to constructing dependent variable.

Hypothesis 1: Net of SES and social ties, individuals who report no confidant or feelings of loneliness will report worse self–rated health than persons who are not socially isolated

Hypothesis 2: Net of SES and social ties, individuals who report no confidant or feelings of loneliness will report more depressive symptoms than persons who are not socially isolated

As shown in Table 7.11., both the effect of no confidant (-.075, $p<.01$) in Model 1 and that of loneliness (-.239, $p<.001$) in Model 2 are statistically significant and negative in direction when individually assessed. The effect of no confidant (-.070, $p<.01$) and that of loneliness (-.235, $p<.001$) remain virtually unchanged when estimated simultaneously in Model 3, suggesting that the effect of the two types of social isolation on self-rated health is independent. This finding is in line with the observation made between social isolation and psychosocial resources where two types of social isolation are effectively independent in predicting all three-types of psychosocial resources. With respect to the second health outcome, depressive symptoms, Model 2 in Table 7.12 indicates that the effect of no confidant (.400, $p<.001$) on depression is statistically significant and positive. Taken together, the results from empirical test provide strong support for the case that those who feel socially isolated are significantly more like to report worse health status than their counter parts, beyond and above their objective social standing as well as their personal relationships.

5.2.3. Research Question 3: To what extent is the effect of social isolation on health mediated by psychosocial resources

Hypothesis 1: Individuals with higher levels of psychosocial resources will report better self-rated health than their counterparts with lower levels of personal mastery, self-esteem, and perceived support

The individual effect of psychosocial resources on self-rated health is assessed in Model 4 through Model 6, and each of which is positively associated with health outcome where the respective effect is estimated as follows: Perceived positive support (.083, $p<.001$),

personal mastery (.118, p<.001), and self-esteem (.103, p<.001). Unlike the effect of the two types of social isolation on self-rated health, however, inclusion of all three types of self-concept in Model 7 reduces the magnitude of the effect of each coefficient substantially. This suggests that the role of three types of resources in shaping self-rated health is not as independent as the effect of the two types of social isolation on perceived health status. In the full model, Model 7, the magnitude of coefficient of support (.067, p<.001), personal mastery, (.093, p<.001), and self-esteem (.064, p<.001) drops 20%, 21%, and 38%, respectively, relative to the effect being assessed individually in Model 4 to Model 6. As for the potential inquiry pertaining to the rank of explanatory power among three types of psychosocial resources can be acquired by the model fit statistics. It appears that self-esteems (R-squared 55.1%) exerts the most explanatory power, followed by personal mastery (54.9%), and perceived support (53.8%).

Hypothesis 2: The effect of social isolation on self-rated health will be partly mediated by psychosocial resources

The mediating effect of psychosocial resources in the association between social isolation and self-rated health can be examined by comparing coefficients in Model 4 to Model 7. The effect of no confidant on self-rated health is either completely or nearly explained by each of the three psychosocial resources. The coefficient of no confidant (-.070, p<.01) in Model 3 is explained completely by support (-.039, ns), and nearly explained by personal mastery and self-esteem (-.048, -.047, p<.1, respectively). In the full model (Model 7), the effect of no confidant further sinks by 33% (-.013, ns) with three types of psychosocial resources being assessed together. The effect of loneliness, on the other hand, remained statistically significant yet the magnitude of the effect substantially reduces as the three types

of self-concept are introduced in the models. The coefficient of loneliness (-.235, p<.001) in Model 3 is substantially explained by support (-.221, p<.001), personal mastery (-.182, p<.001), and self-esteem (-.172, p<.001) individually, and further drops by 39% (-.142, p<.001) in Model 7 when they are estimated simultaneously.

Hypothesis 3: Individuals with higher psychosocial resources will report fewer depressive symptoms relative to those with lower levels of psychosocial resources

The effects of individual psychosocial resources assessed in Model 3 through Model 5 in Table 7.12. are statistically significant and positive, where the coefficient of support is -.402 at the $p < .001$ level, that of personal mastery -1.039 at the $p < .001$ level, and that of self-esteem -1.212. The magnitude of these coefficients sinks substantially when they are assessed together in the full model, Model 7 (support -.247, personal mastery -.724, and self-esteem -.931 all at the $p < .001$ level). The percentage reduction is 28%, 30%, and 23%, with the order of support, personal mastery, and self-esteem.

Hypothesis 4: The effect of social isolation on depressive symptoms will be mediated by psychosocial resources

The effect to no confidant (.400, p<.001) on depression is mediated by three types of self-concept unevenly where the coefficient of support is .260 at the .01 level, that of personal mastery .245 at the .01 level, and that of self-esteem .149 at the .1 level, when they are assessed individually in Model 2 through Model 4. The coefficient of no confidant (-.006, ns) becomes completely explained and statistically non-significant when the three types of psychosocial resources are simultaneously assessed in Model 6.

5.3. Summary of Key Findings

First, with respect to the first research question (i.e., does social isolation predict low levels of psychosocial resources?), the results do support their strong association. The second research question (i.e., does social isolation predict poor health after controlling for SES and social ties?) is also well supported that there are negative association between social isolation and health even after controlling for SES and social ties. Lastly, the third research question indeed received positive support from the empirical results: all three types of psychosocial resources are positively associated with better health outcomes; significant mediating role of psychosocial resources in the effect of social isolation on health.

CHAPTER 6: SOCIAL CONTEXTS, SOCIAL ISOLATION, AND HEALTH

6.1. INTRODUCTION

Positioning social isolation in the center of objective world and subjective perception, the first two empirical chapters explore the association of social isolation with objective social conditions (i.e., SES and social ties), subjective self-perception (i.e., psychosocial resources) and their relationships to health outcomes. In other words, the theoretical framework so far does not allow for social isolation to play a moderating role in one of key linkages. However, it is entirely plausible to theorize that social isolation may play as a moderator. Having this theoretical framework in mind, how might social isolation play a role in coping with stressful situations? Building on stress process framework, this empirical chapter tests an idea that social isolation may act as stress amplifier or as resources modifier. There are two research questions: (1) Is the effect of chronic stressor on health worse for those who are socially isolated? (section 6.2.1.); (2) Is the effect of psychosocial resources on health worse for those who are socially isolated? (section 6.2.2.)

6.2. RESULTS

6.2.1. Research Question 1: Is the effect of chronic stressor on health amplified by social isolation?

Hypothesis 1: The impact of economic hardship on self-rated health is more detrimental among individuals with no confidant relative to individuals who report having confidants

First, the net effect of economic hardship (-.088, $p<.001$) on self-rated health is strong negative, according to Model 1 of the Table 7.13, which is consistent with previous literature: people who experience economic hardship report worse self-rated health than their counterparts. Does social isolation moderate the association between economic hardship and self-rated health? The interaction between no confidant and economic difficulty emerges as a significant and negative predictor (-.051, $p<.05$) in Model 2. The negative interaction indicates that the impact of economic hardship on self-reported health is stronger among persons with no confidant. This added health burden due to no confidant is actually even elevated in the context considering the interaction between no confidant and psychosocial resources. Whenever the interaction between no confidant and psychosocial resources becomes significant (i.e., personal mastery and self-esteem), the interaction coefficient of no confidant by economic hardships enhanced its magnitude to some degree in Model 4 and Model 5.

Hypothesis 2: The impact of economic hardship on self-rated health is more detrimental among individuals with loneliness relative to individuals who do not feel lonely

Table 7.14 reports the interaction effect of loneliness by stressor and loneliness by psychosocial resources on health. First, as presented earlier, the net effect of economic hardship is statistically significant and negative. Second, the interaction between loneliness and economic hardship is statistically significant and positive (.084, $p<.05$) according to

Model 2. This result indicates that the impact of economic hardship among those who feel chronically lonely are in fact significantly smaller than their counterparts who do not feel lonely. In other words, feelings of loneliness in fact play the role of a stress-buffer in the face of economic hardships. This result is counterintuitive and deserves further discussions later in Chapter 7.

6.2.2. Research Question 2: Does social isolation attenuate the positive effect of psychosocial resources on health?

Hypothesis 1: The positive impact of psychosocial resources on self-rated health is weaker among individuals with no confidant

Does social isolation in the form of no confidant reduce the effect of psychosocial resources on self-rated health? As shown in Models 4-5 in Table 7.13, there are two significant interactions terms in two of three psychosocial resources by no confidant: (1) the effect of personal mastery on self-rated health is reduced significantly due to no confidant (-.087, $p<.001$); (2) the effect of self-esteem on self-rated health is undermined significantly due to no confidant (-.066, $p<.01$). The results indicate that the effect of two of three psychosocial resources (i.e., perceived support and personal mastery) on self-rated health is significantly compromised among no confidant.

Hypothesis 2: The positive impact of psychosocial resources on self-rated health is weaker among individuals with loneliness

The interaction between loneliness and two of three psychosocial resources (i.e., perceived support and personal mastery) emerge as statistically significant predictors in Models 3-4 in Table 7.14:(1) the effect of perceived support on self-rated health is greater

among those who feel loneliness (.064, $p<.05$); (2) the effect of mastery on self-rated health is bigger among persons who report loneliness (.107, $p<.001$). The results indicate that the effect of two of three psychosocial resources (i.e., personal mastery and self-esteem) on self-rated health is attenuated among those who feel chronically lonely.

6.3. Summary of Key Findings

First, with respect to the first research question (i.e., Is the effect of chronic stressor on health amplified by social isolation?), the results are contrasted by the type of social isolation indicator: Not having any confidant amplifies the effect of economic hardships on health; feelings of loneliness attenuate the effect of economic hardships on health. Second, the result on the second research question (i.e., is the effect of psychosocial resources on health mitigated by social isolation?) is also splinted by the specific indicator of social isolation: the positive effect of psychosocial resources (i.e., personal mastery and self-esteem) on self-rated health is reduced by no confidant; the health benefit of psychosocial resources (i.e., perceived support and personal mastery) is even enhanced in the presence of loneliness. The implications of these findings are provided in the discussions chapter.

CHAPTER 7: DISCUSSIONS AND CONCLUSION

7.1. SES, SOCIAL TIES, AND SOCIAL ISOLATION

The first empirical chapter examines structural sources of social isolation: SES and social ties. Four research questions are presented along with specific research hypotheses under each of research question. The first research question focuses on the association between SES and social ties, and three hypotheses are posited reflecting the three levels of social ties. The first hypothesis predicting a positive relationship between SES and community ties received partial support. When each SES indicator is used as a separated predictor, education and household income are each related positively to community ties. When all SES indicators were included simultaneously, the effects of education and household income remain practically unchanged, yet the effect of employment status becomes significantly negative. The second hypothesis testing the positive link between SES and social network ties also received partial support. In a separate model for each predictor, the effects of education and household income are positive, whereas the effect of employment is negative. When the effects of SES indicators are estimated net of each, the effect of education practically remains the same, the effect of employment is slightly enhanced, whereas the positive effect of income becomes non-significant. The results of testing the third hypothesis connecting SES with intimate ties document slightly different patterns: (a) individually, the positive effect of education and household income are observed; (b) collectively, however, the effect of education changes from positive to negative, the effect of

employment changes from non-significant to negative, and the positive effect of household income is slightly strengthened.

In sum, as for the association between SES and social ties, the results are mixed. Interestingly, this complexity may be an important finding in itself because it emphasize that it is worthwhile or even necessary to examine the association between these two aspects of social structure in more specific ways separating effects of individual SES characteristics. Aggregating multiple indicators into more general constructs may provide incomplete knowledge of which SES characteristics are particularly beneficial or detrimental for social connectedness. Although it is plausible to think that high socioeconomic standing generally creates more opportunity to build personal relationships, the results from this study underscore the benefit of treating each specific element of SES and social ties separately to understand how they are connected each other.

Among the three indicators of SES, education is the most consistently associated with all three types of social ties. This finding is entirely consistent with literature (Granovetter, 1973; Nan Lin, 1999). There is, however, a surprising pattern that goes against the general consensus—the effect of education on intimate ties turns from positive to negative when all SES indicators are assessed simultaneously. What might explain this? The possible explanation for this finding points to a statistical artifact (or distortion). In essence, high inter-correlation among SES indicators combined with a very strong correlation between household income and intimate ties may create a condition for this statistical distortion.[3] In addition, using household income to predict intimate ties might result in overestimating the

[3] The correlation coefficient between education and employment is r=.28; employment and household income r=.38; and household income and education r=.52. Second, the correlation between intimate ties and family income is r=.39, which is much higher than that of education (r=.12) and employment (r=.10).

effect of household income because it might downplay single-income households. Taken together, the conditions of much closer linkages between household income and other SES indicators as well as household income and intimate ties are likely to contribute to the statistical distortion in the effect of education as well as the statistical exaggeration (i.e., suppression) in the effect of employment on intimate ties reported in Model 5 in Table 7.5. This interpretation is backed by supplementary analysis that the coefficients of education and employment do not change dramatically if the household income variable is absent in Model 5.

Somewhat unexpectedly, employment does not seem to help build social ties, and even appears to have a deterring effect on forming or solidifying personal relationships. The negative side of employment is further enhanced when other elements of SES are taken into account. One may be surprised to find that being employed is either unrelated or sometimes even negatively related to various social ties. Why might employment not be positively associated with social ties? First of all, the negative results may reflect the characteristics of the employment measure used here. The measure used here is a binary variable indicating whether a participant works for pay in the labor force versus not working for pay. It may not tell us much about the quality of employment such as job prestige, job autonomy, etc. Moreover, to some extent, the results reported here may to some extent reflect potential relational burdens or strains embedded in certain jobs. Some job characteristics may discourage individuals from engaging in social relationships. In other words, the measure of employment status in some cases may capture the underlying negative features built into the job environment, which may be responsible for the observation reported in this analysis.

Finally, this finding is intriguing but may require careful interpretation and needs to be replicated in the future study.

The effect of household income on social ties is mostly positive and significant. Whether it is community ties, social network ties, or intimate ties, it seems essential to have good access to financial resources. The effects of household income on building social relationships are strong and consistent. Moreover, as discussed above with respect to education and intimate ties, the linkage of family income with other SES elements and intimate ties might be fairly strong to the extent that this close inter-correlation may be even responsible for a statistical distortion. Again, although this finding requires conservative interpretation, more work needs to be done to further elucidate the link between economic capital and social ties.

The second research question about the relationship between SES and social isolation guides two hypotheses related to the two types of social isolation: no confidant and loneliness. The first hypothesis positing a positive association between low SES and no confidant received strong empirical support: (a) individually, the effect of each SES indicator is significant; (b) collectively, the magnitude of each effect is somewhat reduced yet they still statistically significant. The second hypothesis linking low SES to loneliness also received strong support: a large independent effect of each SES indicator remains significant even when they are assessed simultaneously.

The results clearly demonstrate that social isolation in the form of no confidant and loneliness is significantly influenced by an individual's standing in the social hierarchy. Those who possess more social resources are noticeably less likely to experience social isolation. More importantly, each SES element independently wields preventive power saving

respondents from suffering social isolation. More schooling, having a job, and having more money all contributes to lessening the possibility of going through social isolation. Given this significant association between SES and social isolation, the relevance of 'fundamental social cause' theory in its application to social isolation seems to be valid here.

Once the general association between SES and social isolation is established, one might still wonder about the relative contribution of separate components of SES in predicting social isolation. Applying the lowest AIC fit criteria is useful for this inquiry. According to AIC fit criteria in the no confidant model, the better fit (i.e., lower AIC value) among three indicators comes from household income, employment, and education, in this order. In the loneliness model, the order is household income, education, and employment. Taken together, these findings suggest that being in a higher position in the hierarchical social structure—whether it is higher education, being employed, or more family income, contributes to a lower risk of reporting social isolation. Moreover, the results also suggest that economic capital, relative to education and employment, plays a more important role in preventing social isolation.

The third research question addresses the link between social ties and social isolation, and two research hypotheses are derived for each social isolation indicator as earlier. The first hypothesis testing the association between social ties and no confidant received strong support (a) individually, the effect of each of three levels of social ties is statistically significant (b) collectively, the effect of community ties becomes null, whereas the effects of social network ties and intimate ties slightly increase. With respect to the second hypothesis investigating the association between social ties and loneliness, the empirical results provide strong support as well: (a) individually, the effects of each level of social ties is statistically

significant and negative (b) collectively, each effect largely remains equivalent to the previous levels although the effect of community ties is somewhat attenuated.

The results strongly buttress the case that feelings of social isolation indeed reflect poor objective social relationships. Those who engage in more community service, have more friends or more frequent interactions with them, and have a spouse or partner are much less likely to report socially isolated feelings. Although these findings are important in their own right, they may not tell us about how these three levels of social ties work to prevent isolated feelings. Closer examination reveals interesting dynamics among three social ties variables in relation to social isolation: (a) the beneficial role of community ties in preventing no confidant is in fact due to social network ties and intimate ties (b) the benefit of these lower levels of social ties in preventing social isolation may be even greater if the effects of community ties are held constant, although this pattern of observation is more pronounced in the no confidant model than in the loneliness model. In other words, when it comes to the effectiveness of preventing social isolation, the role of lower levels of social connections (i.e., intimate ties and social network ties) outweigh that of community ties.

According to the no confidant model in Table 7.7, this observation is supported by the AIC fit criteria. The model fit criterion (AIC) reports that the relative effects among three social ties are strongest to weakest in the order of social network ties (AIC=6780), intimate ties (AIC=6786), and community ties (AIC=6821). Given the small difference of 6 between social network ties (Model 7) and intimate ties (Model 8), relative to the average AIC difference between community ties (Model 6) and other lower levels of social ties (Models 7-8), the rank between the two lower levels of social ties should not be overemphasized. The model fit statistic may indicate the relative importance of lower levels social ties over higher

level social ties in preventing feelings of social isolation. This does not mean that having more community ties fails to contribute to preventing the state of no confidant. What this means is that the very preventive benefit of community ties is operating through social network ties and intimate ties. This makes sense because significant others are more likely to be chosen from strong ties than weak ties, and the benefits of weak ties are likely to be indirect in predicting the absence of any significant others.

According to the loneliness model in Table 7.6, the results do not uniformly support the respective hypothesis. The effect of community ties partly operates through inner ties, as shown by the modest mediation effect of community ties. However, incorporating other social ties increases the effects of social network ties and intimate ties, even though the magnitude of this increase is not dramatic. Given that these patterns of mediation and suppression among the three types of social ties are observed both in the loneliness and no confidant models, more work is warranted to replicate this finding. Lastly, the model fit measure indicates that the relative effect of social ties is the strongest to the weakest in the order from intimate ties (3725), community ties (3756), and social network ties (3783).

The fourth research question directly concerns the mediating role of social ties in the link between SES and social isolation, and two hypotheses are derived for each indicator of social isolation. The first hypothesis received mixed support. Although the effect of household income is completely explained by social ties, the effect of employment is somewhat suppressed by social ties, and the effect of education is not entirely mediated by any social ties. Although both SES and social ties have independent effects on no confidant, the specific ways in which the three indicators of SES and the three types of social ties coalesce to exert their influence on the outcome variable are not straightforward. The second

hypothesis involving loneliness only gets partial support from the data: the only significant mediation is observed when the effect of household income on loneliness is completely explained by social ties.

Overall, the evidence for the mediating role of social ties in the association between SES and social isolation is not strong. However, there are several observations that merit careful interpretation. First, with respect to the no confidant model in Table 7.6, the mediating role of social network ties relative to other social ties, seems to stand out. The effect of education on social isolation is completely explained by social network ties. In other words, the benefit of education in preventing the feelings of no confidant operates through enhancing social network ties. Second, the suppressing effect of employment occurs across all three social ties yet the relative contribution to suppression seems to be mainly driven by inner social ties, social networks and intimate ties, rather than community ties. Given the negative associations between employment and social ties, in particular, social network ties, this suppressing effect of employment is not totally unexpected. It indicates that although employment itself helps avoid feelings of having no confidant, the ways in which social ties convey this benefit of employment may take different forms. The fact that the positive effect of employment strengthens when social ties are incorporated in the models is manifested as statistical suppression instead of mediation. Third, the complete mediating effect of family income seems to be entirely attributable to intimate ties because the coefficient of family income in the reference model (Model 5) is virtually unaffected by the individual effect of community ties (Model 6) and social network ties (Model 7). Thus, the benefits of financial resources for preventing the feelings of no confidant are due to the positive effect of financial resources on intimate ties.

As for the loneliness model in Table 7.7, a closer examination reveals which types of social ties are particularly important for conveying the effects of specific SES indicators. First, although not extremely dramatic, taking into account social network ties alone explains a modest portion of the benefit of education. Second, social network ties and intimate ties are primarily responsible for the suppression effect of employment. Third, the measure of intimate ties alone explains the majority of the effect of household income. The general pattern observed with respect to loneliness is also found in the no confidant model.

7.2. Social Isolation, Psychosocial Resources and Health

The second empirical chapter explores the health consequences of social isolation and the psychosocial pathways through which social isolation impacts health outcomes. There are three research questions posed in this chapter. The first research question addresses the negative association between social isolation and psychosocial resources. The results show strong support for each hypothesis related to this research question. Both forms of social isolation - no confidant and loneliness - are negatively associated with mastery, self-esteem, and social support. More importantly, these two facets of social isolation are significant independent prediction of each psychosocial resource, indicating that no confidant and loneliness may indeed represent distinct influences on psychosocial resources.

Why might social isolation be associated with lower levels of psychosocial resources, net of SES and social ties? First, social isolation as operationalized in this study may serve as another type of psychosocial construct that either affects, or works closely with, other psychosocial constructs (i.e., perceived support, personal mastery, and self-esteem). To the extent that these psychosocial resources play significant roles as key self-perceptions or are

related to the link between social conditions and other psychological outcomes, the role of social isolation is also likely to reflect that significance. In other words, the strong independent effects of no confidant and loneliness on psychosocial resources net of objective social conditions may represent the fact that these two facets of social isolation not only stem from similar reality of objective conditions but also operate in similar cognitive contexts. It is important to recognize that the construct of social isolation operates in relation to other factors above and beyond objective social conditions that may be unequal in contexts of social standing and personal relationships. Combining these two contexts may suggest that social isolation studied here may represent our own self-view with respect to those objective social conditions but in different or even opposite ways compared to how psychosocial resources represent that self-view. I argue that this distinctive feature of social isolation can enhance the prevalent approaches to the study of psychosocial resources (such as the stress process model) because these approaches have been limited in addressing how the '*demand*' placed on psychosocial constructs comes to influence other factors. In this sense, perhaps, having no confidant and feeling chronic loneliness may capture psychosocial demands in a way that may work simultaneously with other psychosocial resources.

Second, it is also important to recognize that social isolation may be a heterogeneous construct with respect to psychosocial resources. The empirical results regarding the association between social isolation and psychosocial resources clearly show that there are certain correspondences between psychosocial resources and psychosocial demands. There are two reasons for positing heterogeneity across the domains of social isolation: (a) the coefficients of the social isolation indicators do not seem to be influenced by each other in predicting psychosocial resources (b) there are noticeable differences in the magnitude of the

coefficients of each social isolation indicator. In models predicting social support, the effect of no confidant (-.369, $p<.001$) is more than twice larger than that of loneliness (-.170, $p<.001$). In contrast, the effect of no confidant (-.194, $p<.001$) is more than twice smaller than that of loneliness (-.474, $p<.001$) in models predicting mastery and almost three times smaller in models predicting self-esteem (-.216 for no confidant and -.605 for loneliness, $p<.001$ for both).

The second research question examining the association between social isolation and health outcomes is tested with two hypotheses. The first hypothesis is well supported in that both no confidant and loneliness are negatively associated with self-rated health. Moreover, just as the case of social isolation and psychosocial resources, the two indicators of social isolation are practically independent in predicting self-rated health. The second hypothesis also received strong empirical support in that no confidant is associated with depressive symptoms even after controlling for objective social conditions. Overall, social isolation is associated with negative health status beyond and above objective social conditions.

Why might be the explanations for the observed pattern of findings? First, even though the models reported here control for two of the most salient structural factors (i.e., SES and social ties) that were consistently shown to impact health (Aneshensel, 1992; Berkman & Glass, 2000; J. S. House, Landis, et al., 1988; Pearlin, 1989; Smith & Christakis, 2008), the effect of social isolation on health may also be shaped by additional pathways that are not considered here (e.g., personality traits such as introversion/extraversion and neuroticism, or quality or characteristics of residential neighborhoods). Alternatively, if social isolation fails to predict health outcomes net of SES and social ties, then the results may suggest that the effects of social isolation are completely embedded in objective social

conditions. Moreover, related to the previous point, the effects of social isolation do not control for the key psychosocial resources that are presumed to serve as pathways through which social isolation impacts health.

The third research question involves testing the mediating role of psychosocial resources in the link between social isolation and health. The first hypothesis is well supported: all three psychosocial resources are positively associated with self-rated health. The second hypothesis is also well supported in that (a) the effect of no confidant on self-rated health is completely mediated by the three psychosocial resources and (b) the effect of loneliness on self-rated health is partly mediated by the three psychosocial resources. With respect to depressive symptoms, the third hypothesis is well supported in that each of the psychosocial resources is negatively associated with depressive symptoms. The fourth hypothesis about the mediating role of psychosocial resources in the link between social isolation and depressive symptoms received full support from the empirical data in that the positive effect of no confidant on depressive symptoms is completely mediated by the three types of psychosocial resources.

These empirical results provide strong support for the case that psychosocial resources indeed work quite closely with social isolation in conveying the association of social isolation with worse health outcomes. What might be the implication of this finding? First, the fact that the effects of social isolation on physical and mental health are either significantly or completely mediated by the psychosocial resources suggests that the role of social isolation with respect to health outcomes is closely related to that of psychosocial resources. As a representation of psychosocial demands, the concept of social isolation is

theorized to correspond closely to the psychosocial resources, and the empirical results seem to support this theoretical proposition.

Moreover, beyond the general relationship between social isolation and psychosocial resources with respect to health outcomes, the empirical results strongly imply that there are certain correspondences between specific dimensions of the two psychosocial constructs. On the one hand, relationship-based perceived support mediates the effect of no confidant on health better than personal mastery or self-esteem. On the other hand, cognitive-based personal mastery and self-esteem account for the effect of loneliness on health better than perceived support health. These two observations are likely to attributable to the initial correspondences between social isolation and psychosocial resources that are examined in the first research question. Although these findings are not directly related to the focal research question posed in this section, they seem a promising direction that can provide further insights into the ways that macro-social and psychosocial factors operate to shape health conditions. For example, a potentially important mechanism involves social structure-social isolation-psychosocial resources. This mechanism can be further subdivided into more nuanced pathways, for example (a) SES-loneliness-personal mastery and self-esteem (b) social ties-no confidant-perceived support).

7.3. Social Isolation as Stress Amplifier and Resource Modifier

The third empirical chapter examines psychosocial contexts of social isolation and seeks to discover whether social isolation may play a role of (a) stress amplifier and (b) resource modifier. The first research question involves two stress amplification hypotheses regarding social isolation. The first hypothesis is supported by data that shows that the impact

of economic hardships on self-rated health is more detrimental among individuals with no confidant than their counterparts who report having any confidant. The second hypothesis, which considers loneliness, however, is not supported empirically. The results show that the impact of economic hardship on self-rated health is, in fact, less detrimental for those who report chronic loneliness.

First, why might having no confidant exacerbate the impact of economic hardship on self-rated health? As shown in Table 7.13, the negative effect of economic hardships increases if a person does not have any confidant. A supplemental analysis that examines chronic illness as a stress-amplifier reports similar interaction effects (.038 at the $p<.05$) in relation to no confidant and self-rated health (not shown). This is a strong indication that social isolation places an added burden on already compromised health status from economic hardships, net of social conditions and psychosocial resources. As shown in Table 7.13, the effect of economic hardships on self-rated health is negative, and negative interaction effects between no confidant and economic hardship indicate that these two negative effects are compounded in their consequences on self-rated health. Figure 7.1 illustrates the interaction effect. The figure reports predicted self-rated health score by the presence/absence of a confidant and a level of economic hardships. Three levels of economic hardships are defined by the distance from the mean (i.e., 'high' for +1 standard deviation from the mean of 0, 'average' for the mean of 0, 'low' for -1 standard deviation from the mean). Although the effects of economic hardships are detrimental regardless of whether an individual has a confidant or not (i.e., shown to produce negative slopes for both), the impact of economic hardships is stronger on those who have no confidant (i.e., the impact is displayed by a steeper slope in the no confidant model and a less steep slope in the any confidant model).

Additionally, the health costs of having no confidant seem to be more detrimental in situations of high economic hardship. Compared to those with average economic hardship, the health score for respondents with high economic hardships and no confidant is reported as .45 point lower (3.45-3.00=.45) and for high economic hardships and any confidant is reported as .17 point lower (3.63-3.43=.17).

There are some potential explanations for this interesting pattern. First, confidants, or significant others, are important people with whom to share important information as well as private matters (Thoits, 2011). Consequently, not having any of these people is more likely to lead to situations that are characterized by either more exposure to chronic stressors such as economic hardship or higher vulnerability to the impact of those stressors. Therefore, not having any confidant may exacerbate the impact of economic hardships on self-rate health because the perceived availability of people to confided in can play an important role in dealing with stressful situations including economic hardships.

Second, social isolation in the form of no confidant, as discussed in Chapter 2, may not literally indicate a relational situation in which respondents do not have such persons. It is likely that those who report that they have no confidant may still have personal ties to some extent (e.g., children, parents, relatives or friends), and possibly even intimate ties (e.g., a spouse), because 57% of respondents among those who report having no confidant still have intimate ties, and their profile of other social ties is not radically smaller than that of their counterparts, according to Table 7.1. Perhaps the fact that an individual reports no confidant may reveal his or her relational perceptions with respect to available social ties. Failing to recognize significant others as potential sources of help and support should the need arise is regarded as a defining characteristic of social isolation. Moreover, this impaired perception of

one's relations, in turn, may lead to a lower likelihood of mobilizing available social ties in dealing with stressful situations such as economic hardship, or may influence cognitive contexts via compromised problem solving skills, all of which are likely to contribute more stressful situations (e.g., stress proliferation) (Pearlin, 1989).

Surprisingly (and contrary to the hypothesized mechanism), chronic loneliness appears to act as a stress-buffer rather than a stress amplifier in stressful situations. Figure 7.2 demonstrates predicted self-rated health scores by loneliness and levels of economic hardships. The criteria for the categorization are the same as no confidant model. The graph for loneliness=0 is quite similar to that for no confidant=0 in Figure 7.1, not only in the steepness of the slope but also in the narrowness of the error term, representing the confidence interval for the fitted value. However, the graph for loneliness=1 shows quite different information. Although the fitted value of self-rated health fluctuates greatly across the levels of economic hardships where the predicted self-rated health score for low economic hardships is incredibly low, it is not clear how much credibility this predicted value can have due to a very wide confidence interval. Therefore, it is difficult to conclude definitively whether loneliness plays a stress-buffering role. The margin of error is too large to make a conclusive statement one way or the other.

If loneliness does play a stress-buffering role, what might explain that? First, the state of loneliness is different than the state of no confidant in some significant ways. The measure of no confidant primarily indicates the perceived absence of such persons while the measure of loneliness emphasizes a relational deficit. Although both states are commonly described as undesirable affects, recognizing the differences in the defining characteristics between these two facets may help to explain the unexpected finding regarding the role of loneliness.

Psychologists document that loneliness is marked by affect stemming from unmet needs for interpersonal connections that an individual desires to be fulfilled (Cacioppo, Fowler, & Christakis, 2009; Cacioppo & Hawkley, 2009). They further note that those who feel lonely are often not rejecting opportunities to belong (Cacioppo et al., 2002). In order words, lonely people may still be open to supportive warm gestures, or at least they are less likely to explicitly oppose to them. This receptiveness thus may not discourage any available assistance in the face of economic hardships.

The second research question examines the resource modifier hypothesis with respect to social isolation. The first hypothesis is partly supported by the finding that the effects of two of three psychosocial resources (i.e., personal mastery and self-esteem) are moderated by social isolation. Thus, the positive impacts of personal mastery and self-esteem on self-rated health are weaker among individuals with no confidant. The effect of perceived support, however, is not moderated by social isolation. This lack of a significant interaction indicates that the second hypothesis fails to receive empirical support. Although the effects of two of the three resources (i.e., perceived support and personal mastery) are moderated by social isolation, the direction of associations is contrary to expectations. The positive impact of psychosocial resources on self-rated health is stronger among individuals who are lonely and weaker among those who do not feel loneliness.

Why might the positive impact of psychosocial resources on self-rated health be weaker among individuals with no confidant? First, the positive effects of psychosocial resources on health are well documented (Aneshensel, 1992; Mirowsky & Ross, 2003b; Pearlin et al., 1981; Thoits, 1995). The results of this study reveal that the positive effects of personal mastery and self-esteem on self-rated health are undermined in the presence of

social isolation in the form of no confidant. The compromised effectiveness of personal mastery is illustrated in Figure 7.3. According to the Figure, individuals with no confidants report, on average, lower levels of self-rated health, and the relative health benefit they receive from this resource is not as great as that received by their counterparts who report any confidant. What might explain this? An earlier discussion about the role of no confidant as a moderator of economic hardships can be applied to psychosocial resources as well. In particular, failing to perceive any confidant may indicate compromised cognitive contexts that also affect other psychosocial constructs such as personal mastery and self-esteem.

Why might the positive impact of psychosocial resources on self-rated health be stronger among individuals with loneliness? Figure 7.4 reports predicted self-rated health scores by loneliness and personal mastery. It is clear in Figure 7.4 that those who feel chronically lonely gain more health benefits from high personal mastery relative to those who are not lonely even though the average self-rated health score is very low. For some reason, the positive effects of personal mastery and perceived support are enhanced in the state of chronic loneliness. It is not clear theoretically why this occurs. One possible way to explain this is the difference in baseline health scores between the two groups (i.e., the ceiling effect). As shown in Figure 7.4, the predicted self-rated health score (3.61) for lonely individuals who possess high personal mastery is just above that of individuals (3.46) with low mastery and non-lonely counterparts. For non-lonely individuals, there is practically not much room for improvement because they are already in good health, and this is partly reflected by the small gain provided by psychosocial resources. Conversely, for those lonely individuals, there is much room for improvement and even small boosts from psychosocial resources can make a significant difference in health benefits. Perhaps combining the defining

characteristics of loneliness (i.e., openness to potential offers of support and assistance) with the 'ceiling effect' might help explain this unexpected yet intriguing finding.

7.4. CONCLUSIONS

This dissertation aims to examine social isolation in concert with other factors of interest: (a) structural sources (b) psychosocial processes (c) and social contexts, all of which are theorized to be associated with differing health outcomes. The results generally show strong support for the study hypotheses and the research questions formulated in section 2.6 of Chapter 2. First, feelings of social isolation correspond highly to one's social standing in terms of social stratification and personal connections. Both SES and social ties strongly and independently predict feelings of social isolation in the forms of having no confidant and chronic loneliness. Second, social isolation as a product of objective social conditions interacts closely with psychosocial resources, and the interplay between psychosocial demands (i.e., social isolation) and psychosocial resources (i.e., perceived support, personal mastery, and self-esteem) significantly explains the direct impact of social isolation on health (i.e., self-rated health and depressive symptoms), net of objective social conditions. Third, the results of this study also highlight the role of social isolation in an individual's ability to deal with stressors and in the operation of psychosocial resources. Indeed, social isolation in the form of no confidant not only exacerbates the effects of economic hardship but also undermines the positive effects of personal mastery and self-esteem on self-rated health. Chronic loneliness, to the contrary, seems to take on a stress-buffer role that deserves more attention in future studies.

The fact that the results of this study support the propositions stated, as well as the conceptual framework visually portrayed in Chapter 1, underscores the idea that social isolation is indeed an important variable that may stand alone or in concert with other well-studied social, structural, and psychosocial variables. First, social isolation operationalized in this study emphasizes social roles as well as subjective perception in relation to personal connections. Previous studies on social isolation have clearly documented that the consequences of social isolation are powerful yet dreadful (Aneshensel, 1992; Pearlin, 1989; Thoits, 1995). However, it has not been clear which aspects of social isolation are more salient than others (J.S. House, 2001). This study focuses on two indicators of social isolation that provide excellent opportunities by which they may be compared with respect to other important variables: (a) both indicators of social isolation are independently influenced by objective social roles, (b) the measure of 'no confidant' corresponds highly to perceived support and plays a 'stress-amplifier' role in the face of stressful situations, and (c) the measure of 'loneliness' is more significantly associated with personal mastery and self-esteem, and plays a 'stress-buffer' role for individuals dealing with stressful situations. More research that examines similarities as well as differences between the heterogeneous indicators of social isolation would help us identify and document the relevance of social isolation in relation to other variables.

Second, the results of this study clearly show the potent effects of SES and social ties on social isolation. This is important because the current literature on social isolation is generally limited in showing the structural antecedents of social isolation (J. S. House, Umberson, et al., 1988; Thoits, 2011). Without addressing the factors that are responsible for social isolation, the effectiveness of the treatment of social isolation may be limited as well.

In this regard, the findings of this study demonstrate the independent effects of SES and social ties on social isolation. Moreover, although these results are not equivocal, there are several interesting findings that may suggest that some social ties actually play mediating roles in the link between SES and social isolation. More studies need to follow this one in order to examine the relationship between these two structural factors as they influence social isolation.

Third, social isolation may play an important role in the link between objective social conditions and health and well-being, and the results of this study present strong support for this assertion. Given the rich evidence of the link between one's relative position in a hierarchical society and unequal health status, it is important to understand the mechanisms that explain how and why we observe this association. According to the findings discussed in Chapter 5 and Chapter 6, the effect of social isolation in the form of no confidant on self-rated health is significantly operating through psychosocial resources (i.e., mediating mechanisms), and the positive effects of psychosocial resources (i.e., personal mastery and self-esteem) are attenuated by social isolation. These two findings suggest close interaction between social isolation (i.e., as psychosocial demands) and psychosocial resources in the link between social conditions and health. These findings merit further investigation.

Fourth, the findings that show that the impact of social isolation may vary in different social contexts also deserve more attention in the future study. In reality, low SES, fragile social ties, social isolation, low levels of psychosocial resources, and poor health conditions are likely to go hand in hand. If the finding that social isolation serves as a moderator that either exacerbates (i.e., no confidant) the impact of chronic stressors or attenuates (i.e., loneliness) the positive effects of psychosocial resources turns out to be robust and is

replicated by other data and studies, then perhaps the policy implications drawn from this study could provide simple yet effective ways of dealing with the social problems associated with social isolation. As social isolation as defined in this study is made up of a dichotomy measure of 'no confidant' and 'chronic loneliness,' this information could be easily spread to the general public via slogans, for example.

Finally, the findings that emerge against certain hypotheses also deserve careful follow-up. For example, the finding regarding employment deserves more scrutiny and is awaiting replication. Although the role of employment in shaping social ties is not entirely positive, unlike other elements of SES, the effect of employment on social isolation is unequivocally strongly negative. In other words, being employed does not seem to help build or strengthen social ties, yet it shows positive capability in preventing feelings of social isolation. This raises an interesting dynamic: although it is a simple binary measure, being employed does not relate to social ties but it does relate to social isolation. Moreover, as discussed above, the seemingly positive role of loneliness in the context of economic hardship and in the operation of psychosocial resources definitely warrants careful examination using different measures and data.

7.5. Limitations of the Study and Future Directions

There are several limitations of this study. First, causal inference is limited due to endogeneity and unobserved variables. The statistical results presented in this study are based on the association rather than causation. Likewise, the patterns and dynamics studied here may be influenced by or contingent upon some unobserved variables such as personality traits, health behaviors, or lifestyles. It is likely that the ability to form and sustain social relationships

may be influenced by personality traits such as introversion/extraversion and neuroticism. Additionally, these characteristics, neuroticism in particular, are also likely to interact closely with psychosocial resources such as personal mastery and self-esteem, as well as mental and physical health, thereby serving as confounders in the observed associations. Likewise, the effects of social isolation on health may operate through additional pathways that this study fails to consider. As has been learned from the risk factor approach, physical health conditions are also likely to be shaped by proximate risk factors such as health behaviors (e.g., diet, drinking, smoking, or exercise), and it is important to take into account these characteristics in the study design. These limitations should be addressed in future studies that examine the association between social isolation and health.

Second, the current study examines only limited possibilities by which the impact of social isolation on health is shaped by social and structural contexts. For example, the observed associations between social isolation and health could be shaped by differences in social resources (e.g., SES, social ties, or residential characteristics), sociodemographic variables (e.g., race/ethnicity, gender, and age), and acute and chronic stressors (e.g., chronic illness, racism, dissolved intimate ties). These are important lines of research that may potentially contribute to more specific knowledge of the process of social isolation. Relatedly, this study focuses on examining the impact of social isolation on only some mental and physical health outcomes. The consequences of social isolation may not be limited to these outcomes. The results of this study highlight that social isolation interacts closely with social conditions as well as psychosocial resources. The more the robustness of the link between these factors is confirmed, the wider the applications of this association are likely to grow, until they also include outcome variables (e.g., mortality, suicide, prevention of crime, etc.)

Third, there is room to improvement in measurement and methodology. The measures of social isolation (both no confidant and loneliness) and employment status are constructed with a single binary scale that may increase the chance of measurement error. Obtaining more detailed information such as job characteristics/prestige is encouraged. The measures of personal mastery and self-esteem suffer from low alpha scores, risking the reliability of these measures. Methodologically, this study relies on the random intercept approach in investigating the causes, processes, and consequences of social isolation. The latent variable approach (e.g., structural equation model) or casual mediation approach (e.g., marginal structural model) may provide opportunities of enhancing the methodological advantage that was not feasible with the current approach.

Table 7.1 Weighted Descriptive Statistics by Social Isolation Status (n=3,534)

			Confidant				Loneliness			
	Total		Any Confidant (n=3051)		No Confidant (n=494)		No Loneliness (n=3312)		Loneliness (n=233)	
Variable	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Age	46.90	16.38	46.41	16.21	50.58	17.19	46.84	16.29	48.01	18.12
Female	0.53	0.50	0.54	0.50	0.46	0.50	0.53	0.50	0.62	0.49
Black	0.11	0.31	0.11	0.31	0.12	0.32	0.11	0.31	0.16	0.37
Education	12.37	3.12	12.48	3.07	11.58	3.42	12.45	3.07	10.71	3.65
Employment	0.66	0.47	0.67	0.47	0.57	0.50	0.66	0.47	0.56	0.50
Household Income	5.33	2.58	5.43	2.56	4.60	2.59	5.40	2.56	3.79	2.38
No Confidant	0.12	0.32					0.11	0.31	0.23	0.42
Loneliness	0.05	0.21	0.04	0.20	0.09	0.28				
Community Ties	-0.10	1.50	-0.06	1.49	-0.35	1.56	-0.07	1.50	-0.59	1.39
Social Networks Ties	0.06	1.13	0.11	1.11	-0.30	1.25	0.07	1.11	-0.24	1.45
Intimate Ties	0.73	0.44	0.76	0.43	0.55	0.50	0.75	0.43	0.38	0.49
Perceived Support	-0.04	0.89	0.02	0.86	-0.46	1.03	-0.03	0.87	-0.30	1.19
Mastery	0.00	1.00	0.04	0.98	-0.31	1.08	0.03	0.98	-0.71	1.17
Self-esteem	0.00	1.00	0.04	0.97	-0.31	1.16	0.04	0.96	-0.86	1.38
Chronic Illness	1.02	1.26	0.99	1.24	1.18	1.36	0.99	1.24	1.50	1.58
Economic Difficulty	0.00	0.99	-0.02	0.98	0.11	1.08	-0.03	0.97	0.63	1.21
Self-reported Health	3.70	1.06	3.73	1.05	3.48	1.12	3.71	1.05	3.39	1.28
Depression	13.98	3.50	13.86	3.45	14.89	3.72	13.69	3.20	20.05	4.01

Table 7.2 Correlation Matric among the Variables Used

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.
1. No Confidant	1														
2. Loneliness	0.0747*	1													
3. Education	-0.0923*	-0.1159*	1												
4. Employment	-0.0691*	-0.0430*	0.3289*	1											
5. Household Income	-0.1030*	-0.1299*	0.5022*	0.4006*	1										
6. Community Ties	-0.0618*	-0.0717*	0.0870*	-0.0178*	0.0845*	1									
7. Social Network Ties	-0.1148*	-0.0580*	0.2062*	0.0005	0.0950*	0.2024*	1								
8. Intimate Tie	-0.1487*	-0.1736*	0.0941*	0.0910*	0.4078*	0.0677*	-0.0761*	1							
9. Perceived Support	-0.1712*	-0.0631*	0.1104*	-0.0197*	0.0563*	0.1446*	0.2605*	-0.0664*	1						
10. Personal Mastery	-0.1123*	-0.1551*	0.1883*	0.0689*	0.2059*	0.0394*	0.1047*	0.0398*	0.1769*	1					
11. Self-esteem	-0.1121*	-0.1865*	0.1134*	0.0779*	0.1687*	0.0481*	0.0672*	0.0685*	0.1137*	0.4572*	1				
12. Chronic Illness	0.0467*	0.0838*	-0.3092*	-0.3851*	-0.2917*	-0.0034	-0.0583*	-0.1024*	0.0188*	-0.1083*	-0.1021*	1			
13. Economic Hardship	0.0419*	0.1374*	-0.0733*	0.0174*	-0.3005*	-0.0791*	-0.0565*	-0.1364*	-0.1206*	-0.2859*	-0.2212*	0.011	1		
14. Self-rated Health	-0.0741*	-0.0639*	0.3242*	0.3740*	0.3127*	0.0556*	0.0996*	0.0569*	0.0994*	0.1987*	0.1863*	-0.5300*	-0.1510*	1	
15. Depressive Symptom	0.0940*	0.3784*	-0.1533*	-0.1172*	-0.2055*	-0.1317*	-0.1101*	-0.1321*	-0.1571*	-0.4150*	-0.4263*	0.2204*	0.3316*	-0.3297*	1

Table 7.3 Effect of SES on Community Ties

	M1	M2	M3	M4	M5
Age	0.009***	0.011***	0.008***	0.010***	0.011***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	0.184***	0.203***	0.180***	0.213***	0.211***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Black	0.437***	0.487***	0.438***	0.473***	0.509***
	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)
Education		0.063***			0.054***
		(0.01)			(0.01)
Employment			-0.030		-0.079*
			(0.03)		(0.03)
Household Income				0.038***	0.030***
				(0.01)	(0.01)
Constant	-0.566***	-1.519***	-0.522***	-0.874***	-1.507***
	(0.07)	(0.14)	(0.09)	(0.09)	(0.14)
Level 1 R squared	0.003	0.003	0.003	0.002	0.004
Level 2 R squared	0.039	0.061	0.038	0.054	0.066
Overall R squared	0.026	0.041	0.026	0.036	0.044
Observations	10,148	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.4 Effect of SES on Social Network Ties

	M1	M2	M3	M4	M5
Age	-0.003*	0.000	-0.005***	-0.002*	-0.002*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	0.304***	0.325***	0.282***	0.313***	0.298***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Black	-0.296***	-0.242***	-0.292***	-0.284***	-0.237***
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Education		0.068***			0.072***
		(0.01)			(0.01)
Employment			-0.162***		-0.192***
			(0.03)		(0.03)
Household Income				0.012*	-0.003
				(0.00)	(0.01)
Constant	0.075	-0.957***	0.314***	-0.022	-0.718***
	(0.05)	(0.09)	(0.06)	(0.06)	(0.10)
Level 1 R squared	0.005	0.011	0.012	0.003	0.018
Level 2 R squared	0.073	0.129	0.066	0.084	0.127
Overall R squared	0.034	0.061	0.035	0.037	0.064
Observations	10,148	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.5 Effect of SES on Intimate Ties

	M1	M2	M3	M4	M5
Age	-0.040***	-0.035***	-0.041***	-0.011	-0.033***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Female	-1.891***	-1.939***	-1.907***	-1.250***	-1.326***
	(0.20)	(0.21)	(0.20)	(0.20)	(0.20)
Black	-1.884***	-1.867***	-1.886***	-1.114***	-1.074***
	(0.36)	(0.40)	(0.35)	(0.32)	(0.31)
Education		0.154***			-0.187***
		(0.04)			(0.04)
Employment			-0.113		-1.467***
			(0.14)		(0.17)
Household Income				0.892***	1.009***
				(0.03)	(0.04)
Constant	7.308***	5.316***	7.494***	0.311	4.209***
	(0.36)	(0.69)	(0.41)	(0.41)	(0.64)
AIC	8525.851	8521.642	8527.763	7567.038	7458.903
Observations	10,148	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.6 Effect of SES and Social Ties on No confidant

	M1	M2	M3	M4	M5	M6	M7	M8	M9
Age	0.005	0.003	-0.003	0.002	-0.005	-0.004	-0.005	-0.006	-0.006+
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	-0.587***	-0.618***	-0.681***	-0.696***	-0.748***	-0.725***	-0.662***	-0.801***	-0.708***
	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)	(0.10)
Black	0.071	0.002	0.079	-0.055	-0.050	-0.007	-0.105	-0.083	-0.135
	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)	(0.15)
Education		-0.083***			-0.045*	-0.042*	-0.025	-0.057**	-0.037*
		(0.02)			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Employment			-0.611***		-0.444***	-0.449***	-0.496***	-0.517***	-0.581***
			(0.10)		(0.11)	(0.11)	(0.11)	(0.11)	(0.11)
Household Income				-0.127***	-0.088***	-0.083***	-0.085***	-0.032	-0.020
				(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Community Ties						-0.090**			-0.029
						(0.03)			(0.03)
Social Network Ties							-0.269***		-0.292***
							(0.04)		(0.04)
Intimate Ties								-0.694***	-0.780***
								(0.10)	(0.11)
Constant	-3.034***	-1.782***	-2.149***	-2.014***	-1.004**	-1.137***	-1.244***	-0.471	-0.701*
	(0.18)	(0.30)	(0.23)	(0.22)	(0.32)	(0.33)	(0.32)	(0.33)	(0.33)
AIC	6894.886	6871.622	6862.558	6848.494	6828.611	6821.439	6780.041	6786.324	6726.459
Observations	10,148	10,148	10,148	10,148	10,148	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555	3,555	3,555	3,555	3,555	3,555

Standard errors in parentheses
*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.7 Effect of SES and Social Ties on Loneliness

	M1	M2	M3	M4	M5	M6	M7	M8	M9
Age	-0.015***	-0.021***	-0.023***	-0.021***	-0.027***	-0.024***	-0.027***	-0.030***	-0.028***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	0.330**	0.293*	0.234+	0.200+	0.159	0.200+	0.208+	0.079	0.169
	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)	(0.12)
Black	0.246	0.143	0.246	0.044	0.035	0.151	-0.002	-0.015	0.037
	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)	(0.17)
Education		-0.131***			-0.078***	-0.070***	-0.065**	-0.099***	-0.081***
		(0.02)			(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Employment			-0.650***		-0.385**	-0.384**	-0.412**	-0.508***	-0.535***
			(0.13)		(0.13)	(0.14)	(0.13)	(0.14)	(0.14)
Household Income				-0.188***	-0.135***	-0.126***	-0.132***	-0.047+	-0.033
				(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Community Ties						-0.236***			-0.194***
						(0.04)			(0.04)
Social Network Ties							-0.168***		-0.175***
							(0.05)		(0.05)
Intimate Ties								-1.061***	-1.080***
								(0.13)	(0.13)
Constant	-4.220***	-2.199***	-3.277***	-2.671***	-1.357***	-1.692***	-1.530***	-0.563	-0.994*
	(0.25)	(0.37)	(0.30)	(0.29)	(0.39)	(0.39)	(0.39)	(0.40)	(0.41)
AIC	3877.796	3835.759	3856.025	3811.936	3793.464	3757.855	3783.016	3725.433	3684.702
Observations	10,148	10,148	10,148	10,148	10,148	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555	3,555	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.8 Effect of Social Isolation on Perceived Support

	M1	M2	M3	M4
Age	0.003***	0.003***	0.003***	0.003***
	(0.00)	(0.00)	(0.00)	(0.00)
Female	0.302***	0.281***	0.303***	0.282***
	(0.02)	(0.02)	(0.02)	(0.02)
Black	0.050	0.044	0.050	0.044
	(0.04)	(0.04)	(0.04)	(0.04)
Education	0.018***	0.017***	0.017***	0.016***
	(0.00)	(0.00)	(0.00)	(0.00)
Employment	0.078***	0.062**	0.075***	0.059**
	(0.02)	(0.02)	(0.02)	(0.02)
Household Income	0.019***	0.019***	0.019***	0.018***
	(0.00)	(0.00)	(0.00)	(0.00)
Community Ties	0.023***	0.023***	0.022***	0.022***
	(0.01)	(0.01)	(0.01)	(0.01)
Social Network Ties	0.110***	0.102***	0.108***	0.101***
	(0.01)	(0.01)	(0.01)	(0.01)
Intimate Ties	-0.066**	-0.090***	-0.078***	-0.101***
	(0.02)	(0.02)	(0.02)	(0.02)
No Confidant		-0.372***		-0.369***
		(0.02)		(0.02)
Loneliness			-0.186***	-0.170***
			(0.03)	(0.03)
Constant	-0.682***	-0.571***	-0.645***	-0.538***
	(0.08)	(0.08)	(0.08)	(0.08)
Level 1 R squared	0.007	0.013	0.008	0.014
Level 2 R squared	0.185	0.250	0.192	0.256
Overall R squared	0.091	0.125	0.095	0.128
Observations	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.9 Effect of Social Isolation on Personal Mastery

	M1	M2	M3	M4
Age	0.008***	0.008***	0.008***	0.008***
	(0.00)	(0.00)	(0.00)	(0.00)
Female	-0.157***	-0.168***	-0.154***	-0.165***
	(0.03)	(0.03)	(0.03)	(0.03)
Black	-0.015	-0.018	-0.016	-0.019
	(0.04)	(0.04)	(0.04)	(0.04)
Education	0.035***	0.034***	0.032***	0.031***
	(0.00)	(0.00)	(0.00)	(0.00)
Employment	0.068**	0.058*	0.058*	0.049+
	(0.03)	(0.03)	(0.03)	(0.03)
Household Income	0.039***	0.039***	0.039***	0.039***
	(0.01)	(0.01)	(0.01)	(0.01)
Community Ties	0.006	0.006	0.003	0.002
	(0.01)	(0.01)	(0.01)	(0.01)
Social Network Ties	0.050***	0.045***	0.046***	0.041***
	(0.01)	(0.01)	(0.01)	(0.01)
Intimate Ties	-0.008	-0.021	-0.038	-0.050+
	(0.03)	(0.03)	(0.03)	(0.03)
No Confidant		-0.203***		-0.194***
		(0.03)		(0.03)
Loneliness			-0.482***	-0.474***
			(0.04)	(0.04)
Constant	-0.883***	-0.823***	-0.787***	-0.731***
	(0.09)	(0.09)	(0.09)	(0.09)
Level 1 R squared	0.008	0.010	0.011	0.013
Level 2 R squared	0.186	0.200	0.231	0.244
Overall R squared	0.079	0.085	0.098	0.104
Observations	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.10 Effect of Social Isolation on Self-esteem

	M1	M2	M3	M4
Age	0.008***	0.008***	0.007***	0.007***
	(0.00)	(0.00)	(0.00)	(0.00)
Female	-0.129***	-0.141***	-0.125***	-0.137***
	(0.03)	(0.03)	(0.03)	(0.03)
Black	0.124**	0.121**	0.123**	0.120**
	(0.04)	(0.04)	(0.04)	(0.04)
Education	0.012*	0.011*	0.009+	0.008+
	(0.00)	(0.00)	(0.00)	(0.00)
Employment	0.099***	0.088***	0.087***	0.077***
	(0.02)	(0.02)	(0.02)	(0.02)
Household Income	0.051***	0.051***	0.051***	0.051***
	(0.00)	(0.00)	(0.00)	(0.00)
Community Ties	0.008	0.008	0.004	0.004
	(0.01)	(0.01)	(0.01)	(0.01)
Social Network Ties	0.046***	0.041***	0.041***	0.036***
	(0.01)	(0.01)	(0.01)	(0.01)
Intimate Ties	0.074**	0.059*	0.034	0.021
	(0.02)	(0.02)	(0.02)	(0.02)
No Confidant		-0.228***		-0.216***
		(0.03)		(0.03)
Loneliness			-0.614***	-0.605***
			(0.04)	(0.04)
Constant	-0.782***	-0.716***	-0.662***	-0.600***
	(0.09)	(0.09)	(0.09)	(0.09)
Level 1 R squared	0.039	0.041	0.055	0.056
Level 2 R squared	0.144	0.166	0.191	0.211
Overall R squared	0.090	0.101	0.121	0.131
Observations	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.11 Sequential Effect of Social Isolation and Psychosocial Resources on Self-rated Health

	M1	M2	M3	M4	M5	M6	M7	M8
Age	0.001	0.001	0.001	0.001	0.001	-0.000	0.000	-0.000
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	0.020	0.016	0.021	0.017	-0.006	0.037	0.032	0.023
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Black	-0.043	-0.044	-0.043	-0.044	-0.048	-0.042	-0.057	-0.054
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Education	0.044***	0.043***	0.042***	0.042***	0.041***	0.038***	0.041***	0.037***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Employment	0.244***	0.240***	0.239***	0.235***	0.231***	0.231***	0.229***	0.224***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Household Income	0.023***	0.023***	0.023***	0.022***	0.021***	0.018***	0.017***	0.015**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Community Ties	0.032***	0.032***	0.030***	0.030***	0.028***	0.030***	0.030***	0.028***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Social Network Ties	0.006	0.004	0.004	0.002	-0.006	-0.002	-0.002	-0.011
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Intimate Ties	-0.074**	-0.079**	-0.089***	-0.093***	-0.085***	-0.088***	-0.095***	-0.083***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)

Table 7.11 (continued)

No Confidant		-0.075**		-0.070**	-0.039	-0.048+	-0.047+	-0.013
		(0.03)		(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Loneliness			-0.239***	-0.235***	-0.221***	-0.182***	-0.172***	-0.142***
			(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Perceived Support					0.083***			0.067***
					(0.01)			(0.01)
Personal Mastery						0.118***		0.093***
						(0.01)		(0.01)
Self-esteem							0.103***	0.064***
							(0.01)	(0.01)
Constant	3.251***	3.273***	3.298***	3.318***	3.362***	3.403***	3.378***	3.458***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Level 1 R squared	0.058	0.059	0.061	0.062	0.062	0.069	0.060	0.069
Level 2 R squared	0.522	0.522	0.525	0.526	0.538	0.549	0.552	0.566
Overall R squared	0.316	0.317	0.319	0.320	0.327	0.336	0.334	0.346
Observations	10,148	10,148	10,148	10,148	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.12 Sequential Effect of No Confidant and Psychosocial Resources on Depressive Symptoms

	M1	M2	M3	M4	M5	M6
Age	-0.049***	-0.049***	-0.048***	-0.043***	-0.041***	-0.038***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	0.497***	0.519***	0.631***	0.335***	0.342***	0.326***
	(0.09)	(0.09)	(0.09)	(0.08)	(0.08)	(0.07)
Black	0.313*	0.319*	0.337*	0.301*	0.469***	0.434***
	(0.14)	(0.14)	(0.14)	(0.12)	(0.12)	(0.11)
Education	-0.085***	-0.083***	-0.076***	-0.044**	-0.068***	-0.041**
	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)
Employment	-0.453***	-0.434***	-0.414***	-0.404***	-0.345***	-0.324***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.07)
Household Income	-0.097***	-0.097***	-0.090***	-0.062***	-0.037*	-0.020
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Community Ties	-0.162***	-0.161***	-0.152***	-0.153***	-0.151***	-0.142***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Social Network Ties	-0.189***	-0.180***	-0.141***	-0.148***	-0.138***	-0.097***
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Intimate Tie	-0.743***	-0.718***	-0.751***	-0.717***	-0.642***	-0.689***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
No Confidant		0.400***	0.260**	0.245**	0.149+	-0.006
		(0.09)	(0.09)	(0.09)	(0.09)	(0.08)
Perceived Support			-0.402***			-0.247***
			(0.04)			(0.03)
Personal Mastery				-1.039***		-0.724***
				(0.03)		(0.03)
Self-esteem					-1.212***	-0.931***
					(0.03)	(0.03)
Constant	17.718***	17.603***	17.380***	16.807***	16.778***	16.276***
	(0.30)	(0.30)	(0.30)	(0.27)	(0.27)	(0.26)
Level 1 R squared	0.035	0.034	0.034	0.063	0.098	0.116
Level 2 R squared	0.289	0.299	0.331	0.522	0.507	0.602
Overall R squared	0.166	0.170	0.187	0.300	0.309	0.366
Observations	10,148	10,148	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555	3,555	3,555

Standard errors in parentheses
*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.13 Effect of interaction of No Confidant by Economic Hardship and Psychosocial Resources on Self-rated Health

	M1	M2	M3	M4	M5
Age	-0.002*	-0.002**	-0.002**	-0.002**	-0.002**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	0.019	0.020	0.020	0.018	0.019
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Black	-0.037	-0.036	-0.036	-0.033	-0.036
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Education	0.038***	0.038***	0.038***	0.038***	0.038***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Employment	0.225***	0.225***	0.224***	0.226***	0.225***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Household Income	0.005	0.004	0.005	0.004	0.004
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Community Ties	0.027***	0.027***	0.027***	0.027***	0.027***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Social Network Ties	-0.012	-0.012	-0.012	-0.012	-0.012
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Intimate Ties	-0.088***	-0.088***	-0.089***	-0.086***	-0.088***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
No Confidant	-0.015	-0.012	-0.001	-0.030	-0.023
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Loneliness	-0.128***	-0.125***	-0.124***	-0.125***	-0.127***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)

Table 7.13 (continued)

Perceived Support	0.063***	0.064***	0.060***	0.064***	0.064***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Personal Mastery	0.082***	0.082***	0.082***	0.093***	0.082***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Self-esteem	0.058***	0.058***	0.058***	0.059***	0.069***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Chronic Illness	-0.263***	-0.262***	-0.262***	-0.262***	-0.263***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Economic Hardship	-0.088***	-0.082***	-0.083***	-0.080***	-0.081***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
No Confidant X Economic Hardship		-0.051*	-0.050*	-0.078**	-0.069**
		(0.02)	(0.02)	(0.03)	(0.03)
No Confidant X Perceived Support			0.025		
			(0.03)		
No Confidant X Personal Mastery				-0.087***	
				(0.02)	
No Confidant X Self-esteem					-0.066**
					(0.02)
Constant	3.593***	3.599***	3.599***	3.592***	3.597***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Observations	10,148	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Table 7.14 Effect of interaction of Loneliness by Economic Hardship and Psychosocial Resources on Self-rated Health

	M 1	M 2	M 3	M 4	M 5
Age	-0.002*	-0.002*	-0.002*	-0.002*	-0.002*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Female	0.019	0.020	0.022	0.023	0.021
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Black	-0.037	-0.037	-0.037	-0.035	-0.038
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Education	0.038***	0.038***	0.038***	0.038***	0.038***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Employment	0.225***	0.226***	0.225***	0.226***	0.226***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Household Income	0.005	0.005	0.005	0.005	0.005
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Community Ties	0.027***	0.027***	0.027***	0.026***	0.027***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Social Network Ties	-0.012	-0.012	-0.012	-0.012	-0.012
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Intimate Ties	-0.088***	-0.087***	-0.089***	-0.085***	-0.087***
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
No Confidant	-0.015	-0.015	-0.015	-0.017	-0.015
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Loneliness	-0.128***	-0.160***	-0.149***	-0.098*	-0.146***

Table 7.14 (continued)

	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Perceived Support	0.063***	0.064***	0.058***	0.063***	0.064***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Personal Mastery	0.082***	0.081***	0.081***	0.073***	0.081***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Self-esteem	0.058***	0.059***	0.058***	0.057***	0.056***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Chronic Illness	-0.263***	-0.263***	-0.263***	-0.264***	-0.263***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Economic Hardship	-0.088***	-0.095***	-0.096***	-0.098***	-0.096***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Loneliness X Economic Hardship		0.084**	0.099**	0.110***	0.091**
		(0.03)	(0.03)	(0.03)	(0.03)
Loneliness X Perceived Support			0.064*		
			(0.03)		
Loneliness X Personal Mastery				0.107***	
				(0.03)	
Loneliness X Self-esteem					0.025
					(0.03)
Constant	3.593***	3.593***	3.595***	3.593***	3.593***
	(0.08)	(0.08)	(0.08)	(0.08)	(0.08)
Observations	10,148	10,148	10,148	10,148	10,148
Number of id	3,555	3,555	3,555	3,555	3,555

Standard errors in parentheses

*** $p<0.001$, ** $p<0.01$, * $p<0.05$, + $p<0.1$

Figure 7.1 Predicted Self-rated Health by No Confidant and Economic Hardships

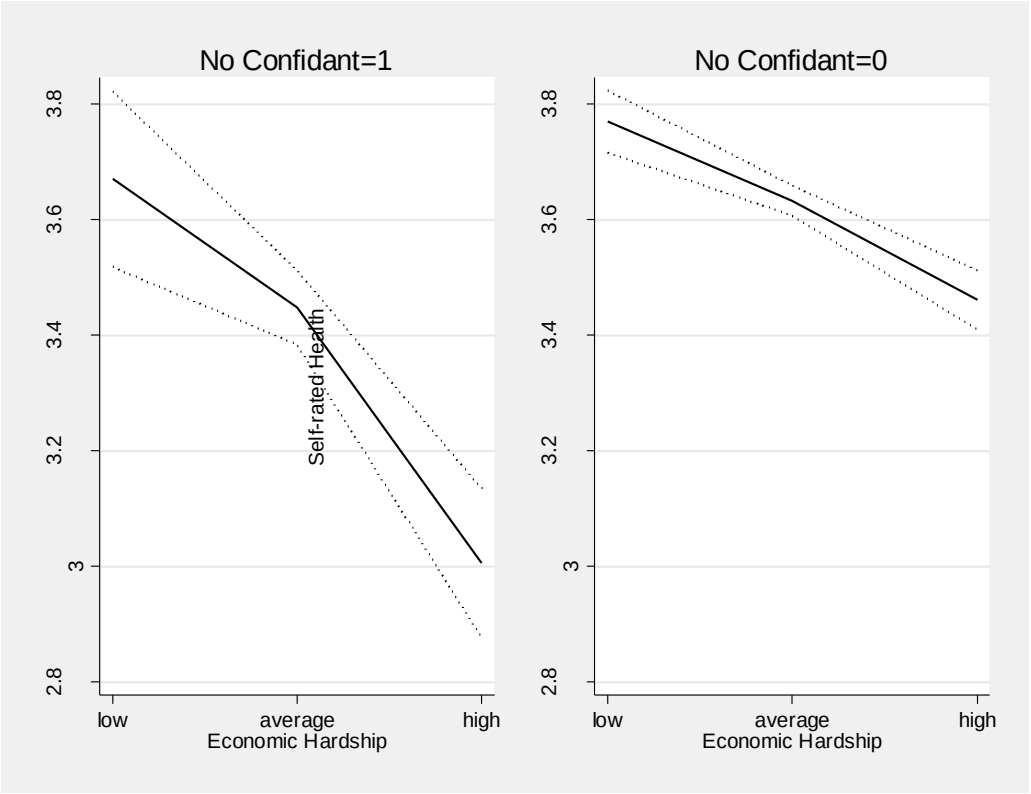


Figure 7.2 Predicted Self-rated Health by Loneliness and Economic Hardships

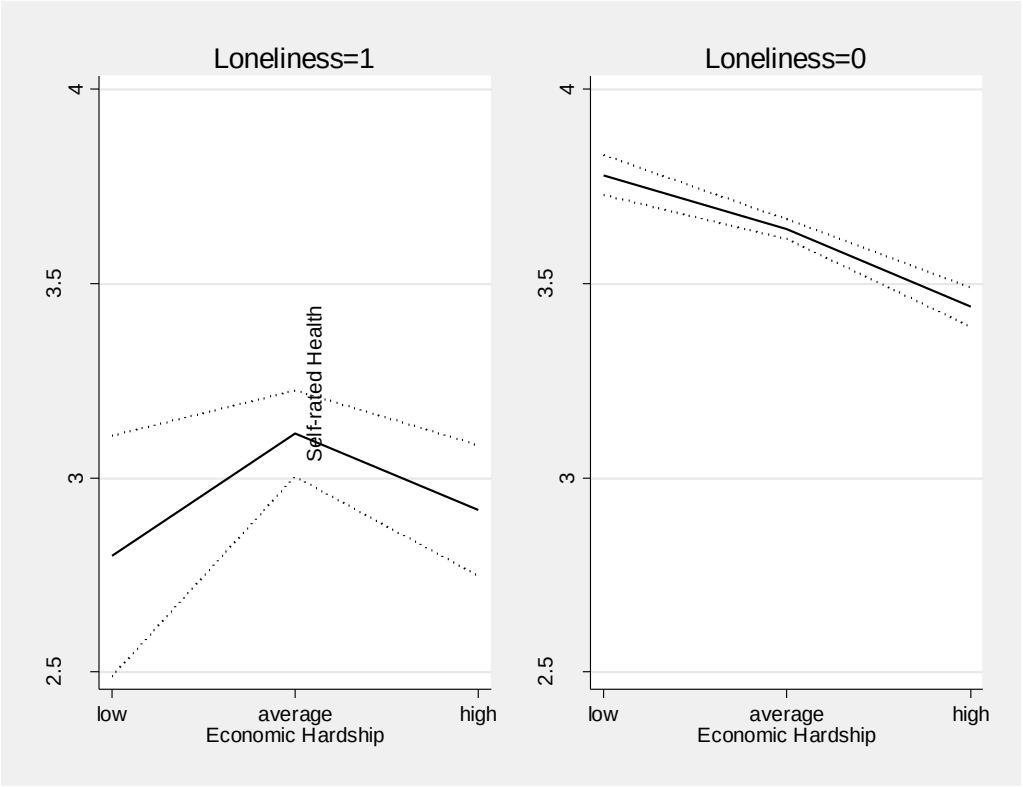


Figure 7.3 Predicted Self-rated Health by No Confidant and Personal Mastery

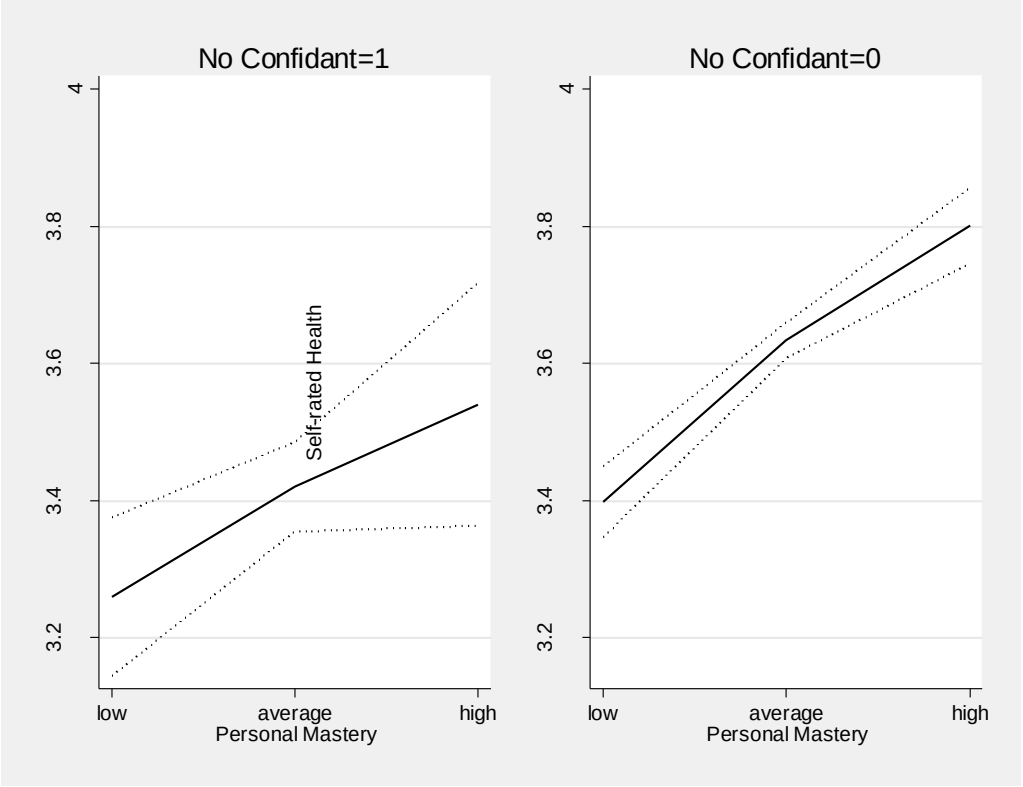
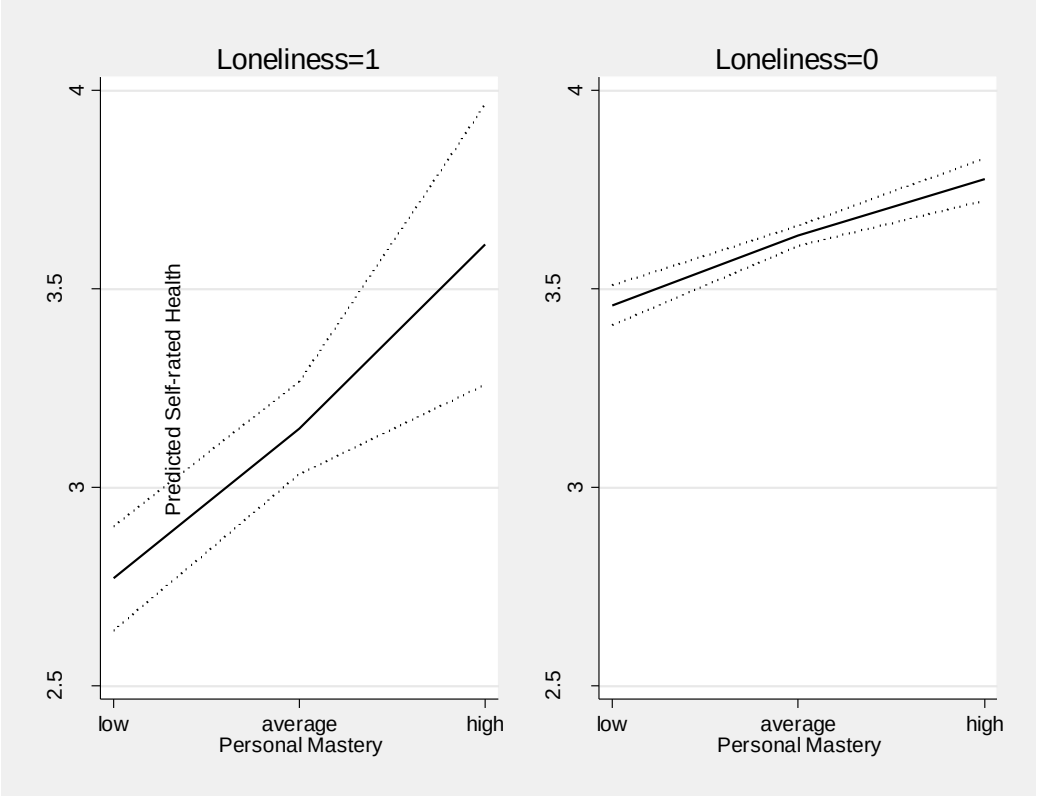


Figure 7.4 Predicted Self-rated Health by Loneliness and Personal Mastery



REFERENCES

Aneshensel, C. S. (1992). Social Stress - Theory and Research. *Annual Review of Sociology, 18*, 15-38.

Aneshensel, C. S., Rutter, C. M., & Lachenbruch, P. A. (1991). Social-Structure, Stress, and Mental-Health - Competing Conceptual and Analytic Models. *American Sociological Review, 56*(2), 166-178.

Antonucci, T. C., & Akiyama, H. (Eds.). (1995). *Convoys of Social Relations: Family and Friendships Within A Life Span Context*.

Barefoot, J. C., Brummett, B. H., Helms, M. J., Mark, D. B., Siegler, I. C., & Williams, R. B. (2000). Depressive Symptoms and Survival of Patients With Coronary Artery Disease. *Psychosomatic Medicine, 62*(6), 790-795.

Bassuk, S. S., Glass, T. A., & Berkman, L. F. (1999). Social Disengagement and Incident Cognitive Decline in Community-Dwelling Elderly Persons. *Annals of Internal Medicine, 131*(3), 165-173.

Bellah, R. N. (1996). *Habits of The Heart: Individualism and Commitment in American Life*: Univ of California Pr.

Berkman, L. F. (Ed.). (1985). *The Relationship of Social Networks and Social Support To Morbidity and Mortality*. Orlando, Fla: Academic Press.

Berkman, L. F., & Glass, T. (2000). Social Integration, Social Networks, Social Support and Health. in L. F. Berkman & I. Kawachi (Eds.), *Social Epidemiology* (Pp. 137-173). Oxford Oxford University Press.

Berkman, L. F., & Kawachi, I. (2000). *Social Epidemiology*. Oxford ; New York: Oxford University Press.

Bowlby, J. (2008). *Attachment*: Basic Books.

Brummett, B. H., Barefoot, J. C., Siegler, I. C., Clapp-Channing, N. E., Lytle, B. L., Bosworth, H. B., ... & Mark, D. B. (2001). Characteristics of Socially Isolated Patients with Coronary Artery Disease Who Are at Elevated Risk for Mortality. *Psychosomatic Medicine*, *63*(2), 267-272.

Cacioppo, J. T., Fowler, J. H., & Christakis, N. A. (2009). Alone in The Crowd: The Structure and Spread of Loneliness in A Large Social Network. *Journal of Personality and Social Psychology*, *97*(6), 977.

Cacioppo, J. T., & Hawkley, L. C. (2003). Social Isolation and Health, With An Emphasis On Underlying Mechanisms. *Perspectives in Biology and Medicine, 46*(3), S39-S52.

Cacioppo, J. T., & Hawkley, L. C. (2009). Loneliness. W.W. Norton & Company.

Cacioppo, J. T., Hawkley, L. C., Crawford, L. E., Ernst, J. M., Burleson, M. H., Kowalewski, R. B., . . . Berntson, G. G. (2002). Loneliness and Health: Potential Mechanisms. *Psychosomatic Medicine, 64*(3), 407.

Cohen, S. (2004). Social Relationships and Health. *American Psychologist, 59*(8), 676.

Cohen, S., & Syme, S. L. (1985). *Social Support and Health*. Orlando, Fla.: Academic Press.

Cooley, C. H. (1902). The Looking-Glass Self. *O'Brien*, 126-128.

Cornwell, E. Y., & Waite, L. J. (2009a). Measuring Social Isolation Among Older Adults Using Multiple Indicators From The Nshap Study. *The Journals of*

Gerontology Series B: Psychological Sciences and Social Sciences, 64(Suppl 1), I38-I36.

Cornwell, E. Y., & Waite, L. J. (2009b). Social Disconnectedness, Perceived Isolation, and Health Among Older Adults. *Journal of Health and Social Behavior, 50*(1), 31-48.

De Jong Gierveld, J., & Hagestad, G. O. (2006). Perspectives On The Integration of Older Men and Women. *Research On Aging, 28*(6), 627-637.

Eisenberger, N. I. (2012a). The Neural Bases of Social Pain: Evidence For Shared Representations With Physical Pain. *Psychosomatic Medicine, 74*(2), 126.

Eisenberger, N. I. (2012b). The Pain of Social Disconnection: Examining The Shared Neural Underpinnings of Physical and Social Pain. *Nature Reviews Neuroscience, 13*(6), 421-434.

Ellison, C. G. (1991). Religious Involvement and Subjective Well-Being. *Journal of Health and Social Behavior, 32*, 80-99.

Ellison, C. G. (1993). Religious Involvement and Self-Perception Among Black-Americans. *Social Forces, 71*(4), 1027-1055.

Elo, I. (2009). Social Class Differentials in Health and Mortality: Patterns and Explanations in Comparative Perspective.

Fischer, C. S. (2005). Bowling Alone: What Is The Score? *Social Networks, 27*(2), 155-167.

Fischer, C. S. (2009). The 2004 Gss Finding of Shrunken Social Networks: An Artifact? *American Sociological Review, 74*(4), 657-669.

Fischer, C. S. (2011). *Still Connected: Family and Friends in America Since 1970*. New York: Russell Sage Foundation.

Foster, H., Hagan, J., & Brooks-Gunn, J. (2008). Growing Up Fast: Stress Exposure and Subjective Weathering in Emerging Adulthood. *Journal of Health and Social Behavior, 49*(2), 162-177.

Friedman, E. M., Karlamangla, A. S., Almeida, D. M., & Seeman, T. E. (2012). Social Strain and Cortisol Regulation in Midlife in The Us. *Social Science & Medicine, 74*(4), 607-615.

Granovetter, M. S. (1973). The Strength of Weak Ties. *American Journal of Sociology*, 1360-1380.

Hedeker, D., & Gibbons, R. D. (1997). Application of Random-Effects Pattern-Mixture Models For Missing Data in Longitudinal Studies. *Psychological Methods, 2*(1), 64.

Herd, P., Goesling, B., & House, J. (2007). Socioeconomic Position and Health: The Differential Effects of Education Versus Income On The Onset Versus Progression of Health Problems. *Journal of Health and Social Behavior, 48*(3), 223-238.

Holt-Lunstad, J., Smith, T. B., & Layton, J. B. (2010). Social Relationships and Mortality Risk: A Meta-Analytic Review. *Plos Medicine, 7*(7). Doi: E1000316 10.1371/Journal.Pmed.1000316

House, J., & Kahn, R. L. (Eds.). (1985). *Measures and Concepts of Social Support*. Orlando, Fla: Academic Press.

House, J. S. (2001). Social Isolation Kills, But How and Why? *Psychosomatic Medicine, 63*(2), 273.

House, J. S. (2007). Americans' Changing Lives: Waves I, Ii, and Iii, 1986, 1989, 1994, and 2002 [Computer File]. Icpsr04690-V3.

House, J. S., Landis, K. R., & Umberson, D. (1988). Social Relationships and Health. *Science, 241*(4865), 540-545.

House, J. S., Umberson, D., & Landis, K. R. (1988). Structures and Processes of Social Support. *Annual Review of Sociology, 14*, 293-318.

Idler, E. L., & Benyamini, Y. (1997). Self-Rated Health and Mortality: A Review of Twenty-Seven Community Studies. *Journal of Health and Social Behavior*, 21-37.

Kaplan, G. A. (1996). People and Places: Contrasting Perspectives On The Association Between Social Class and Health. *International Journal of Health Services, 26*(3), 507-519.

Kawachi, I., & Berkman, L. F. (2001). Social Ties and Mental Health. *Journal of Urban Health, 78*(3), 458-467.

Krause, N. (1987). Chronic Financial Strain, Social Support, and Depressive Symptoms Among Older Adults. *Psychology and Aging, 2*(2), 185.

Krause, N. (1991). Stress and Isolation From Close Ties in Later Life. *Journals of Gerontology, 46*(4), S183-S194.

Krueger, P., & Chang, V. (2008). Being Poor and Coping With Stress: Health Behaviors and The Risk of Death. *American Journal of Public Health, 98*(5), 889.

Kunz-Ebrecht, S., Kirschbaum, C., & Steptoe, A. (2004). Work Stress, Socioeconomic Status and Neuroendocrine Activation Over The Working Day. *Social Science & Medicine, 58*(8), 1523-1530.

Laird, N. M. (1988). Missing Data in Longitudinal Studies. *Statistics in Medicine, 7*(1-2), 305-315.

Little, R. J. (1995). Modeling the Drop-Out Mechanism in Repeated-Measures Studies. *Journal of the American Statistical Association, 90*(431), 1112-1121.

Little, R. J., & Rubin, D. B. (1989). The Analysis of Social Science Data With Missing Values. *Sociological Methods & Research, 18*(2-3), 292-326.

Lin, N. (1999). Social Networks and Status Attainment. *Annual Review of Sociology*, 467-487.

Lin, N., & Ensel, W. M. (1984). Depression-Mobility and Its Social Etiology - The Role of Life Events and Social Support. *Journal of Health and Social Behavior, 25*(2), 176-188.

Lin, N., Ye, X. L., & Ensel, W. M. (1999). Social Support and Depressed Mood: A Structural Analysis. *Journal of Health and Social Behavior, 40*(4), 344-359.

Link, B. (2008). Epidemiological Sociology and The Social Shaping of Population Health. *Journal of Health and Social Behavior, 49*(4), 367-384.

Link, B., & Phelan, J. (1995). Social Conditions as Fundamental Causes of Disease. *Journal of Health and Social Behavior, 35*, 80-94.

Macevoy, J. P., & Asher, S. R. (2012). When Friends Disappoint: Boys' and Girls' Responses To Transgressions of Friendship Expectations. *Child Development, 83*(1), 104-119.

Marmot, M. (2005). Social Determinants of Health Inequalities. *The Lancet, 365*(9464), 1099-1104.

Mcpherson, M., Smith-Lovin, L., & Brashears, M. E. (2006). Social Isolation in America: Changes in Core Discussion Networks Over Two Decades. *American Sociological Review, 71*(3), 353-375.

Mead, G. H. (1934). Mind. *Self and Society, Chicago*.

Mirowsky, J., & Ross, C. (2007). Creative Work and Health. *Journal of Health and Social Behavior, 48*(4), 385-403.

Mirowsky, J., & Ross, C. E. (1998). Education, Personal Control, Lifestyle and Health - A Human Capital Hypothesis. *Research On Aging, 20*(4), 415-449.

Mirowsky, J., & Ross, C. E. (2003a). *Education, Social Status, and Health*: Aldine Transaction.

Mirowsky, J., & Ross, C. E. (2003b). *Social Causes of Psychological Distress*: Aldine De Gruyter.

Mirowsky, J., & Ross, C. E. (2007). Creative Work and Health. *Journal of Health and Social Behavior, 48*(4), 385-403.

Mossey, J. M., & Shapiro, E. (1982). Self-Rated Health: A Predictor of Mortality Among The Elderly. *American Journal of Public Health, 72*(8), 800-808.

Musick, M. A., House, J. S., & Williams, D. R. (2004). Attendance At Religious Services and Mortality in A National Sample. *Journal of Health and Social Behavior, 45*(2), 198-213.

Paxton, P. (1999). Is Social Capital Declining in The United States? A Multiple Indicator Assessment 1. *American Journal of Sociology, 105*(1), 88-127.

Pearlin, L. I. (1989). The Sociological-Study of Stress. *Journal of Health and Social Behavior, 30*(3), 241-256.

Pearlin, L. I., Menaghan, E. G., Lieberman, M. A., & Mullan, J. T. (1981). The Stress Process. *Journal of Health and Social Behavior, 22*(4), 337-356.

Pudrovska, T. (2013). Job Authority and Breast Cancer. *Social Forces, 92*(1), 1-24.

Pudrovska, T., Schieman, S., Pearlin, L. I., & Nguyen, K. (2005). The Sense of Mastery as A Mediator and Moderator in The Association Between Economic Hardship and Health in Late Life. *Journal of Aging and Health, 17*(5), 634-660. Doi: 10.1177/0898264305279874

Putnam, R. D. (2001). *Bowling Alone: The Collapse and Revival of American Community*. New York: Simon and Schuster.

Rogers, R. G., Hummer, R. A., & Nam, C. B. (2000). *Living and Dying in The Usa: Behavioral, Health, and Social Differentials of Adult Mortality*: Academic Pr.

Rosenberg, M. (1981). The Self-Concept: Social Product and Social Force. *Social Psychology: Sociological Perspectives*, 593-624.

Ross, C. E., & Bird, C. E. (1994). Sex Stratification and Health Lifestyle: Consequences For Men's and Women's Perceived Health. *Journal of Health and Social Behavior*, 161-178.

Russell, D., Cutrona, C. E., Rose, J., & Yurko, K. (1984). Social and Emotional Loneliness: An Examination of Weiss's Typology of Loneliness. *Journal of Personality and Social Psychology, 46*(6), 1313.

Schnittker, J. (2007). Look (Closely) At All The Lonely People. *Journal of Aging and Health, 19*(4), 659-682.

Smith, K. P., & Christakis, N. A. (2008). Social Networks and Health. *Annu. Rev. Sociol, 34*, 405-429.

Singer, J. D., & Willett, J. B. (2003). *Applied Longitudinal Data Analysis: Modeling*

Change and Event Occurrence. Oxford University Press.

Storr, A. (2005). *Solitude: A Return To The Self*: Simon and Schuster.

Thoits, P. A. (1995). Stress, Coping, and Social Support Processes - Where Are We - What Next. *Journal of Health and Social Behavior*(Extra), 53-79.

Thoits, P. A. (2011). Mechanisms Linking Social Ties and Support To Physical and Mental Health. *Journal of Health and Social Behavior, 52*(2), 145-161.

Turner, R. J., & Marino, F. (1994). Social Support and Social Structure: A Descriptive Epidemiology. *Journal of Health and Social Behavior, 35*(3), 193-212.

Umberson, D., & Montez, J. K. (2010). Social Relationships and Health. *Journal of Health and Social Behavior, 51*(1 Suppl), S54-S66.

Umberson, D., Williams, K., Powers, D. A., Liu, H., & Needham, B. (2006). You Make Me Sick: Marital Quality and Health Over The Life Course. *Journal of Health and Social Behavior, 47*(1), 1-16.

Van Baarsen, B., Snijders, T. A., Smit, J. H., & Van Duijn, M. A. (2001). Lonely But Not Alone: Emotional Isolation and Social Isolation as Two Distinct Dimensions of Loneliness in Older People. *Educational and Psychological Measurement, 61*(1), 119-135.

Weiss, R. S. (1973). Loneliness: The Experience of Emotional and Social Isolation.

Wilkinson, R. (1997). Socioeconomic Determinants of Health: Health Inequalities: Relative Or Absolute Material Standards? *Bmj, 314*(7080), 591.

Williams, D., & Collins, C. (1995). Us Socioeconomic and Racial Differences in Health: Patterns and Explanations. *Annual Review of Sociology, 21*(1), 349-386.

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